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**Regret as Autobiographical Memory**

**Ian Michael Davison**

Thesis submitted for the degree of Doctor of Philosophy

Durham University

2010

## Table of Contents

<b>Table of Contents</b>	ii
<b>List of Tables</b>	ix
<b>List of Figures</b>	x
<b>Declaration</b>	xii
<b>Acknowledgements</b>	xiii
<b>Abstract</b>	1
<b>Chapter 1: Introduction</b>	<b>3</b>
<b>1.0</b> Defining regret: decision outcome and autobiographical memory	3
<b>1.1</b> What we know about regret	7
<i>1.1.1 Who experiences regret, what do people regret and why?</i>	9
<i>1.1.2 The impact of regret</i>	12
<b>1.2</b> Regret and decision making	17
<i>1.2.1 Anticipated regret</i>	18
<i>1.2.2 The effect of regret on subsequent choice</i>	22
<i>1.2.3 Regret and responsibility</i>	23
<b>1.3</b> Decisions and regret as a counterfactual emotion	24

1.3.1	<i>Agency and counterfactual thinking</i>	27
1.3.2	<i>Agency and autobiographical regrets</i>	29
1.4	Regret's temporal pattern: Gilovich and Medvec's (1995) account	31
1.4.1	<i>Summary and evaluation</i>	34
1.5	Regret as autobiographical memory	36
1.5.1	<i>The structural distinction</i>	37
1.5.2	<i>The phenomenological distinction</i>	43
1.6	Changes over time: summarisation and semanticisation	45
1.6.1	<i>Temporal gradients and impairments of autobiographical memory</i>	46
1.7	Emotion and autobiographical memory	48
1.7.1	<i>Remembering negative events</i>	49
1.7.2	<i>Regret and the fading affect bias</i>	51
1.7.3	<i>Remembering emotional events differently</i>	52
1.8	The temporal pattern of regret re-considered	54

<b>Chapter 2: Regret and the reminiscence bump</b>	<b>57</b>
<b>2.0</b> Chapter Overview	57
<b>2.1</b> Memory across the lifespan: the reminiscence bump	57
2.1.1 <i>Replications of the reminiscence bump and some variations</i>	58
2.1.2 <i>Explaining the reminiscence bump</i>	59
<b>2.2</b> The life script account	62
<b>2.3</b> Study 1: specific and general lifespan regrets of people in their sixties	67
2.3.1 <i>Method</i>	67
2.3.2 <i>Results</i>	69
2.3.3 <i>Discussion of Study 1</i>	79
<b>2.4</b> Study 2: replication and extension of Study 1	80
2.4.1 <i>Method</i>	81
2.4.2 <i>Results</i>	83
2.4.3 <i>Discussion of Study 2</i>	93
<b>2.5</b> Chapter discussion	95
2.5.1 <i>The overlap between the distinctions</i>	99
2.5.2 <i>The relationship between regrets and the life script</i>	99

<b>Chapter 3: Regret and the preminiscence bump</b>	<b>101</b>
<b>3.0</b> Chapter Overview	101
<b>3.1</b> Thinking about past and future autobiographical experience	101
3.1.1 <i>Thinking about past and future life scripts</i>	102
3.1.2 <i>Thinking about where things might go wrong in life: the preminiscence bump</i>	103
<b>3.2</b> Study 3. The experienced and anticipated regrets of young adults	107
3.2.1 <i>Method</i>	108
3.2.2 <i>Results: experienced regrets</i>	112
3.2.3 <i>Results: anticipated regrets</i>	118
3.2.4 <i>Summary of Study 3</i>	124
<b>3.3</b> Study 4a: young adults predict their own life regrets	124
3.3.1 <i>Method</i>	125
3.3.2 <i>Results</i>	127
3.3.3 <i>Summary of Study 4a</i>	132
<b>3.4</b> Study 4b: young adults predict the life regrets of a peer	133
3.4.1 <i>Method</i>	133
3.4.2 <i>Results</i>	133

3.4.3	<i>Summary of Study 4b</i>	139
<b>3.5</b>	<b>Study 4c: young adults predict the regrets of an average person</b>	<b>140</b>
3.5.1	<i>Method</i>	140
3.5.2	<i>Results</i>	143
3.5.3	<i>Summary of Studies 3 – 4c</i>	147
<b>3.6</b>	<b>Chapter discussion</b>	<b>149</b>
	<b>Chapter 4: Regret and other emotions</b>	<b>154</b>
<b>4.0</b>	<b>Chapter overview</b>	<b>154</b>
<b>4.1</b>	<b>Introduction: ‘varieties of regret’</b>	<b>155</b>
4.1.1	<i>Comparing intrapersonal and interpersonal regrets</i>	157
4.1.2	<i>The emotion clusters used in Study 5</i>	159
<b>4.2</b>	<b>Study 5: examining the affective profiles of specific and general self- and other-focussed regrets</b>	<b>161</b>
4.2.1	<i>Method</i>	161
4.2.2	<i>Results</i>	164
4.2.3	<i>Summary of the main findings</i>	178
<b>4.3</b>	<b>Chapter discussion</b>	<b>180</b>

<b>Chapter 5: The consequences of regret</b>	<b>185</b>
<b>5.0</b> Chapter overview	185
<b>5.1</b> Introduction: the impact of regret over time	185
<b>5.2</b> Study 6: measuring the impact of regret	193
5.2.1 <i>Method</i>	193
5.2.2 <i>Results</i>	199
5.2.3 <i>Summary of the main findings</i>	212
<b>5.3</b> Chapter discussion	213
<b>Chapter 6: General Discussion</b>	<b>218</b>
<b>6.0</b> Chapter overview	218
<b>6.1</b> Summary of the main research aims and findings	218
<b>6.2</b> Implications: narrow and broad	221
6.2.1 <i>The relationship between the distinctions</i>	223
6.2.1.1 <i>Factors that make general inactions</i>	223
6.2.1.2 <i>Factors that make short term specific actions</i>	227
6.2.2 <i>One distinction or two?</i>	229
6.2.3 <i>Regret, autobiographical memory and decision making</i>	233



6.2.4	<i>The question of scripts</i>	235
6.2.4.1	<i>Norms for regret</i>	235
6.2.4.2	<i>Content</i>	237
6.2.4.3	<i>Regret and other emotions</i>	239
6.3	Limitations and future directions	242
6.4	Conclusion	247
	<b>References</b>	249
	<b>Appendices</b>	288

## List of Tables

Table 2.1	<i>Ratings of persistence and intensity across time for the specific and general regrets, with means and standard deviations</i>	89
Table 3.1	<i>Experienced regrets: ratings of persistence and intensity across time for specific and general regrets, with means, standard deviations and number of observations (n)</i>	115
Table 4.1	<i>Reliability statistics for all emotion clusters, with alphas (<math>\alpha</math>) and Pearson correlations</i>	168
Table 4.2	<i>Zero-order correlations between all emotion clusters</i>	169
Table 4.3	<i>Summary statistics for the 2 (type) by 4(cluster) by 3 (focus) ANOVA, with number of observations (n), mean, and standard deviations</i>	171
Table 4.4	<i>Summary statistics for the 2 (agency) by 4(cluster) by 3 (focus) ANOVA, number of observations (n), means and standard deviations</i>	173
Table 5.1	<i>Analysis by specificity: descriptive statistics for all critical variables, including means, standard deviations, and sample sizes (N) for combined, specific and general regrets</i>	202
Table 5.2	<i>Analysis by agency: descriptive statistics for all critical variables, including means, standard deviations and sample sizes (N) for combined, action and inaction regrets</i>	207
Table 5.3	<i>Life domains ranked by the total number of consequences per domain (Cons), with mean consequences per domain (M), standard deviations and percentage of positive and negative consequences</i>	212

## List of Figures

Figure 2.1	<i>Study 1: original responses. Proportion of regrets as a function of time in decade intervals for specific and general regrets. Error bars represent the standard error of the mean</i>	72
Figure 2.2	<i>Study 1: recategorised responses. Proportion of regrets as a function of time in decade intervals for specific and general regrets. Error bars represent the standard error of the mean</i>	77
Figure 2.3	<i>Group A (60s). Proportion of regrets as a function of time in decade intervals for combined, specific and general regrets. Error bars represent the standard error of the mean</i>	84
Figure 2.4	<i>Group B (40s). Proportion of regrets as a function of time in decade intervals for combined, specific and general regrets. Error bars represent the standard error of the mean</i>	87
Figure 2.5	<i>Specific regrets located in the most recent decade as a function of time elapsed in 2 –year bins. Results collapse across study and age group</i>	93
Figure 3.1	<i>Study 3: proportion of participants' own anticipated regrets as a function of time in decade intervals for specific and general regrets. Error bars represent the standard error of the mean</i>	120
Figure 3.2	<i>Study 4a: proportion of participants' own anticipated regrets as a function of time in decade intervals for specific and general regrets. Error bars represent the standard error of the mean</i>	129
Figure 3.3	<i>Study 4b: proportion of regrets predicted for a peer as a function of time in decade intervals for specific and general regrets. Error bars represent the standard error of the mean</i>	135

Figure 3.4	<i>Study 4c: proportion of regrets predicted for an average person as a function of time in decade intervals for specific and general regrets</i>	
	<i>Error bars represent the standard error of the mean</i>	144
Figure 3.5	<i>The distribution of anticipated general regrets for studies 3, 4a, 4b and 4c</i>	148
Figure 3.6	<i>The distribution of anticipated specific regrets for studies 3, 4a, 4b and 4c</i>	149
Figure 4.1	<i>The temporal distribution of specific and general regrets as a function of time in decade intervals for participants over the age of 40</i>	176

## **Declaration**

I declare that the work presented in this thesis is my own and has been generated by me as the result of my own original research. None of the data or material presented in the thesis has been submitted previously or simultaneously for consideration for a degree in this or any other university.

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## Abstract

An autobiographical memory framework for the study of regret is contrasted with traditional decision-making approaches to regret. Based on the autobiographical memory framework a memory-based distinction is introduced between regrets for specific and general events. Across 6 studies the distinction is applied to issues related to the temporal pattern of regret and to survey data showing that long term inaction regrets tend to concern experiences from early adulthood. Studies 1 and 2 examined the temporal distribution of experienced regrets within the context of the “reminiscence bump” phenomenon from autobiographical memory research. Participants regretted proportionally more experiences from early adulthood than from elsewhere in the lifespan, but this pattern obtained for general regrets only: specific regrets were more randomly distributed and tended to concern more recent events. General regrets were more likely to concern inactions than actions, whereas specific regrets were as likely to concern actions as inactions. Consistent with regret surveys, the most frequently reported regrets concerned family, intimate relationships (including marriage and parenting), education, work, character and self-actualisation. These findings were interpreted with reference to life scripts. Studies 3 and 4 assessed the contribution of the life script to the temporal distribution of imagined future regrets. Young adults imagined and dated experiences they anticipated either themselves (Studies 3 and 4a), a peer (Study 4b) or an average person (Study 4c) might regret in life. A *preminiscence bump* peaking in decade three was found for general regrets. Across Studies 3 and 4 imagined regrets focussed on similar experiences, were described in predominantly general terms and were overwhelmingly associated with inaction. The experienced regrets of young adults (Study 3) were similar in content to the regrets described by older adults about

the same period (Studies 1 and 2). The results are interpreted as evidence that a culturally timetabled script deems some events more important and regret-worthy than others. Study 5 examined regret's relationship with other emotions. Specific regrets more often evoked hot and moral emotions, while general regrets more often evoked wistful emotions, and neither type was more strongly associated with despair emotions. Study 5 also considered a distinction between self- and other-focussed regrets. Self-actualisation and other-focussed regrets were statistically indistinguishable and both were more likely than self-achievement regrets to evoke moral emotions such as guilt, remorse, and shame. Finally, Study 6 showed that general regrets had a broader impact than did specific regrets insofar as they affected more domains and produced more consequences. Across all of the studies in the thesis the domains of family, intimate relationships, character, education, work and self-development are the main source of real and imagined regrets. It is argued that the representation of event knowledge in autobiographical memory combined with culturally determined scripts together shape what people regret in life.



## Chapter 1: Introduction

### 1.0 Defining regret: decision outcome and autobiographical memory

Regret signals a failure to reconcile present reality with past expectations, goals or desires. It is the feeling evoked by the realisation that things have not turned out as wished and it may occur in response to explicit expectations or something unexpected, but whether regret stems from contemplating a life of unfulfilled aspirations or having just inadvertently hurt someone's feelings, at its heart is the *thought* that things could, would, or should have been better otherwise. This thought may also include a wish that events could be undone (the cutting remark we wish could be taken back) but wishing that events could be undone is not necessary for regret: a woman may genuinely regret marrying her husband without regretting having the children produced by the marriage. Because regret involves comparing *what is* with *what might have been*, it has been described as a 'counterfactual' emotion (Bell, 1982; Kahneman & Miller, 1986; Kahneman & Tversky, 1982a), as the 'emotional offspring' of counterfactual thinking (Roese, 2005), or more evocatively as 'the persistence of the possible' (Landman, 1993). In section 1.3 the role of counterfactual thinking in the study of regret will be considered more specifically, but it is introduced here simply to underscore an aspect of regret research that has literally defined the field.

Regret researchers have defined regret as "a more or less painful cognitive and emotional state of feeling sorry for misfortunes, limitations, losses, transgressions, shortcomings, or mistakes" (Landman, 1993; p. 36), or more specifically as "a comparison-based emotion of self-blame, experienced when people realise or imagine that their present situation would have been better had they

decided differently in the past” (Zeelenberg & Pieters, 2007, p. 6). These latter authors also describe regret as “the prototypical decision related emotion” (p. 15).

Both definitions emphasise the evaluation of outcomes brought about in one way or another by personal decisions, but neither explicitly mentions memory or remembering. This omission is indicative of an approach to regret that has its roots in judgement and decision-making (Bell, 1982; Loomes & Sugden, 1982; see Connolly & Zeelenberg, 2002 and Zeelenberg, 1999 for reviews of this field), and has tended to see regret only as the *product* of a judgement. Although this view is changing and researchers are recognising now that regret also results from a *process* of judging and reasoning (Connolly & Reb, 2005; Zeelenberg & Pieters, 2007), what remains absent from conceptualisations of experienced regret is that it is also an act of *remembrance* insofar as it requires, to a greater or lesser degree, turning one’s attention to past events. Memory is both the medium through which regrets are experienced and what they are made of. This fact has been largely overlooked by regret researchers, who either bypass memory completely or treat it as an auxiliary function supporting more interesting reasoning processes. Memory researchers on the other hand have shown little direct interest in regret as a construct with unique mnemonic characteristics, although this also seems to be changing (see Beike & Krone, 2008; Beike, Markman & Karadogan, 2009).

The importance of remembering to regret is apparent in the following lexicographical definitions: “to remember, think of (something lost), with distress or longing.” (Oxford English Dictionary, 1991), or similarly: “to remember with a sense of loss or feeling of having done wrong; to wish otherwise” (The Chambers Dictionary, 1998). The position adopted throughout this thesis is that regret is a process of remembering and reasoning, the products of which are types of memories

ranging from vivid recollections upon which counterfactual thoughts are constructed, to abstract acknowledgements that things would be better had past events been otherwise.

Autobiographical memory combines personally remembered experiences and knowledge about the self. One influential model of autobiographical memory describes autobiographical memories as “primarily records of success or failure in goal attainment” (Conway & Pleydell-Pearce, 2000; p. 266). Given that regret is strongly associated with past choices and lost opportunities (Roese & Summerville, 2005; Zeelenberg & Pieters, 2007), and has been operationally defined as “unfulfilled or unattainable intentions or goals” (Lecci, Okun & Karoly, 1994; p. 731) or “unattained goals” (Jokisaari, 2003), it could be argued that stripped bare, regret is a particular way of remembering failed or unfulfilled goals. The archive of most personal histories will contain one or two records of regret, and because regret anchors our current cognitive- affective state to past choices, to missed opportunities and unfulfilled goals, it reminds us not only who we are, but also *who we might have been* had we followed different paths. In this broad sense regret and autobiographical memory inextricably bind behaviour and selfhood, and just as the main function of AM is to ‘ground’ the self in reality by monitoring discrepancies between past and current goals (Conway & Pleydell-Pearce, 2000) regret has the potential to ‘ground’ people dysfunctionally to *lost possible selves* (King & Hicks, 2007).

So regret is not just about what people do, it is also about who they are and how they remember themselves. This alone would justify a memory-based approach to regret, but there are many areas of autobiographical memory research that would also lend themselves to interpretation from a regret perspective. Generally speaking, the study of emotion in autobiographical memory concerns the relative influences of

variables related to valence and intensity (for an overview see Levine & Pizzaro, 2004), and yet much autobiographical memory research concerns experiences easily accommodated by regret. Memories for transitional educational experiences (Pillemer, Picariello, Law & Reichman, 1996), first-time romantic episodes (Robinson, 1992b), ‘benchmark events’ (Elnick, Margrett, Fitzgerald & Labouvie-Vief, 1999), or self-defining memories (Singer & Salovey, 1993; Singer, Rexhaj & Baddeley, 2008) could all involve regret. Viewing regret from a memory perspective requires a slight shift of emphasis, but the way regret has traditionally been conceptualised has not encouraged such a shift.

The core contention of this thesis is that models of autobiographical thought for past and future events can explain patterns of regret across the lifespan. As the Introduction reviews both the regret and autobiographical memory literatures, it comprises two main parts, each with two main sub-sections. The review of the regret literature begins in Section 1.0 with a summary of current knowledge about the demographics of regret; who it affects, in which areas of life, and with what psychological and physical consequences. Sections 1.2 to 1.4 trace the development of regret research from the decision making literature to its current status as a research topic within mainstream social and cognitive psychology. The review of the autobiographical memory literature begins in Section 1.5 with a summary of research related to the structural, phenomenological and temporal properties of the autobiographical memory knowledge base. Section 1.7 summarises research related to emotion and autobiographical memory.

## **1.1 What we know about regret**

Despite a proliferation of research interest in regret over recent years (see Zeelenberg & Pieters, 2007) and notwithstanding the definitions already provided, it is often very difficult to know what regret is precisely or how it differs from a cluster of closely related emotions. Regret has been reliably distinguished from disappointment on the basis that regret implicates one's own role in bringing about the undesired outcome, whereas disappointment arises when circumstances fail to meet our expectations (Zeelenberg, van Dijk, Manstead & van der Pligt, 1998), but the distinction between regret and emotions such as remorse, guilt and shame remains unclear, as these emotions are often grouped together (Shaver, Schwartz, Kirson & O'Connor, 1987; Storm & Storm, 1987). These associations are considered empirically in Chapter 5, but it is helpful at this point to briefly clarify some key differences and similarities, because regret encompasses a variety of cognitive and affective states and is often expressed by proxy. Shimanoff (1984) for instance found that out of the twenty most commonly mentioned emotions in everyday conversations, regret was second only to love; but she lists at least two terms (guilt and sorry) used by her participants as proxies for regret. Sabini and Silver (2005) have questioned whether regret is a discrete emotion at all, arguing that regret requires only the acknowledgement that some aspect of a situation is regrettable. The emotional colouration of that cognition is determined by whichever emotion(s) dominate at the time.

With regard to guilt and shame, regret is generally considered to be the broader notion (Landman, 1993; Thalberg, 1963) and tends to have stronger associations with guilt than with shame (Smith, Webster, Parrot & Eyre, 2002; Tangney, 1995; Zeelenberg, van Dijk, van der Pligt, Manstead, van Empelen &

Reinderman, 1998), and this relationship may be mediated by self-blame (Mandel & Dhimi, 2005). Regret is a complex, secondary emotion (Johnson-Laird & Oatley, 1989) whereas guilt and shame are often seen as basic emotions (Izard, 1977). Guilt and shame are socially determined “self-conscious” emotions evoked when one’s behaviour is judged against social or moral norms (Ausubel, 1955; Tangney & Fischer, 1995) but regret, although self-focussed (Mandel, 2003), is not in itself socially determined. Regret has also been shown to focus on harm done to the self, while guilt more often involves transgressions against others (Berndsen, van der Pligt, Doosje & Manstead, 2004; Mandel, 2003). Although shame also focuses on the self, it is concerned with how the self is judged by others and is more characterological than is regret, because shame arises from a global evaluation of the self as bad (Tangney, 1992).

The distinction between regret and remorse is particularly ambiguous and researchers often use the terms interchangeably (Brehaut et al., 2003; Connolly et al., 1997; Roese & Summerville, 2006; Smith et al., 2002). The lexicon does little to help, defining remorse as a feeling of “compunction, *deep regret*, (emphasis added) for a sin or wrong committed” (OED, 1991). But regret is generally assumed to be the broader notion (Landman, 1993; Thalberg, 1963) and remorse has a stronger moral dimension: the sadness of regret comes from comparing a past behaviour with some current standard, but the sadness of remorse acknowledges that a past behaviour was morally wrong (Johnson-Laird & Oatley, 1989). In the legal and criminological literatures remorse is most often associated with specific actions that cause harm to others, and Proeve and Howell (2006) cite studies showing that a sincere expression of remorse may have a huge impact on sentencing decisions. The orientation in regret may be towards the self, another, or a state of the world,

whereas remorse is “an awakened sense of the reality of another” (Gaita, 1991, p. 50) and is orientated towards that harmed other (Cordner, 2007; Dillman, 1999).

#### *1.1.1 Who experiences regret, what do people regret and why?*

Landman (1993) cites surveys showing that between 35% and 97% of people acknowledge having experienced regret. Men and women think regret-related counterfactual thoughts with equal frequency (Landman & Manis, 1992), although sex differences have been found: women are more likely than men to report family and relationship regrets (Jokisaari, 2004) and within the domain of romantic relationships men are more likely than women to regret not having had more partners (Roese, Pennington, Janicki, Li & Kenrick, 2006). Regret is found in samples of young and old participants (Wrosch & Heckhausen 2002), in cross-cultural studies of American, Chinese, Japanese and Russian samples (Gilovich, Wang, Regan & Nishina, 2003) and in studies carried out independently in Turkey (Toktas, 2002), France (Bonneton & Zhang, 2008), Finland (Jokisaari, 2003; 2004), Germany (Timmer, Westerhof & Dietmann-Kohli, 2005; Wrosch & Heckhausen, 2002) and the U.K. (Feeney, Gardiner, Johnston, Jones & McElvoy, 2005). So although it is impossible to say categorically that regret is universal, most regret researchers assume it to be so.

Many people claim not to have experienced regret, but as Gilovich and Medvec (1995) point out it is difficult to accept such claims at face value: a life full of decisions and choices that did not bring at least some encounter with regret hardly seems plausible. It seems more likely that people distance themselves from regret because it is an acknowledgement that one has made mistakes and it has implications for the character by association with moral emotions like guilt, shame and remorse.

The perception of regret as something potentially harmful is exemplified by books aimed at helping people to ‘overcome’ life regrets (Freeman & De Wolf, 1989), although this view is changing amongst researchers, who increasingly adopt a more functional approach and treat regret as a resource (Epstude & Roese, 2008; King & Hicks, 2007; Roese, 2005). A recent survey even shows that relative to other negative emotions regret (along with guilt) is positively regarded as a bringer of insight (Saffrey, Summerville & Roese, 2008).

The most comprehensive account of what people regret in life comes from a meta-analysis of eleven regret-ranking studies carried out between 1989 and 2003 by Roese and Summerville (2005), who found that the most frequently regretted life domains were education, career, romance, parenting, the self, and leisure. These findings come from surveys and experimental studies involving both sexes, all age groups, and different methods of eliciting regret. Some studies asked people directly what they regretted in life (Gilovich & Medvec, 1994; Jokisaari, 2003) or which of life’s activities they most regretted not having pursued (Wrosch & Heckhausen, 2002), while others asked people to say how they would do things differently if they could live life over again (DeGenoa, 1992; Hattiangadi, Medvec & Gilovich, 1995; Kinnier & Metha, 1989; Landman & Manis, 1992; Landman, Vanderwater, Stewart & Malley, 1995). Lecci, Okun and Karoly, (1994) asked people about their unfulfilled goals, which were seen as proxies for regret.

On the basis of these findings Roese and Summerville (2005) proposed that the most frequently regretted areas of life are those that are seen as offering greater opportunity for future corrective action. According to this *opportunity principle*, people feel regret when they think there is still something that can be done about the regrettable situation, but when no such opportunity exists, they either engage in



dissonance reducing thoughts or re-construe their regrets. Roese and Summerville bolster their argument with evidence from a number of sources and they test it directly using the regrets of college students. The authors first created a domain ranking from the students' regrets (Study 2a) and then presented the lists of life domains from the student rankings and the meta-analysis to a different sample of students (Study 2b), who selected one domain perceived to be high in opportunity and one domain perceived to be low in opportunity. Opportunity was defined in terms of how easily or not the students felt able to change that area of life. They then recalled a regret from each of the selected domains (one high, one low opportunity) and rated it for intensity and importance. The results offered support for the opportunity principle by showing that domains rated high in opportunity were also those domains ranked highest in the student and meta-analysis rankings. Also, high opportunity domains contained more intense regrets and were rated as more important than low opportunity domains.

Beike, Markman and Karadogan (2009) challenge the basic premise of the opportunity principle and argue that regret stems not from realising that an opportunity is still viable, but from recognising that it is irredeemably lost. They point to the fact that education, the most regretted life domain in Roese and Summerville's (2005) meta-analysis, would not represent a source of *future* opportunity for many of the participants surveyed, some of whom were elderly adults. This point is especially apt given that the regrets for missed educational opportunities reported by Hattiangadi et al. (1995) came from an intellectually gifted cohort with an average age of 74yrs, all with above average IQs (140) and 70% of whom were university graduates. Moreover, the practical value of education, as Roese (2005) himself points out, comes from its potential as a gateway to success

and happiness in many other walks of life, since it enhances one's earning potential. This seems an unlikely explanation for why older adults in particular would regret missed educational opportunities and it is more likely that many such regrets simply reflect the realisation that life *would have been* better with more education.

Other types of regret are also difficult to explain using the future opportunity principle. People often regret not having expressed their feelings to dead loved ones or romantic partners, or else they lament 'not being there' for people. Such regrets do seem to represent irredeemably lost opportunities and they are unlikely to be ameliorated by dissonance reduction or re-construal. The realisation that they cannot be resolved only compounds the regret. The problem may be to do with how an opportunity is construed, whether it calls for external changes in circumstances, or some internal change in attitude. So while it is true that we cannot resurrect the dead to tell them we love them, paradoxically, such regrets may offer *more* opportunity not less, because all they require is a change of heart, and this can occur even on one's deathbed.

Examples could be found for and against both arguments and it is probably the case that opportunities differ qualitatively across domains and situations and so engender more or less tractable regrets. However, as will be demonstrated in Chapters 2, 3 and 5 there may be other cultural or moral explanations for why some domains are more frequently regretted than others.

### *1.1.2 The impact of regret*

Whatever the content or cause of regrets they have many adverse psychological and physical consequences. Lecci, et al. (1994) examined the influence of life regrets as predictors of psychological adjustment in a sample of 18

to 59 year olds, who evaluated their regrets and current goals on dimensions such as importance, impact, control, investment (time and effort), disappointment and distress, and completed self-reported measures of psychological wellbeing. People who listed having more goals also reported more regrets, and having more regrets reduced the perceived importance of current goals. People who reported more regrets also scored higher on measures of depression, and while number of reported regrets was not associated with lower life satisfaction in the sample overall, it was negatively correlated with life satisfaction amongst the older adults. People who reported having invested a lot of time and energy in their regrettably failed goals also scored lower on measures of life satisfaction. Overall, having regrets for unfulfilled goals was shown to negatively affect psychological wellbeing.

Similar findings are reported by Jokisaari (2003) for a Finnish sample of 18 to 82 year olds. Participants appraised their regrets in terms of importance, consequences (how much impact the regrets had) and changeableness, and then provided ratings on several health-related measures including life satisfaction, physical symptoms (headaches, colds, coughs, skin problems, backaches and so on), depressive symptoms, and general negative affect (nervousness, anxiety, unhappiness). Regardless of age, people who rated their regrets as having a high impact on their lives scored lower on measures of life satisfaction and reported more physical health symptoms. In a subsequent study Jokisaari (2004) found that impact differed across life domains: regrets of education and work were negatively associated with measures of life satisfaction, while regrets related to the self were negatively associated with scores on a depression inventory.

McKee, Wilson, Chung, Hinchliff, Goudie, Elford and Mitchell (2005) surveyed older adults living in residential and nursing homes to see whether their

physical and psychological wellbeing were adversely affected by increased thinking about the past (reminiscence) and life regrets. All of the residents reported some degree of reminiscence, though fewer than half reported having regrets. However, those who did have regrets were found to be poorer in social wellbeing, had lower morale, and experienced less positive affect than those who reported having no regrets.

One criticism of such studies is their reliance on self-reported measures of wellbeing. Wrosch, Bauer, Miller and Lupien (2007) addressed this issue by using more direct biological markers of physical health, such as salivary cortisol levels (Study 1) and cold symptoms and sleep patterns (Study 2). The hormone cortisol is associated with stress and reduced immune response and so is a reliable and non-invasive way of gauging how psychological factors influence physical wellbeing.

In their first study Wrosch et al. (2007) also assessed people for 12 acute physical symptoms (including headaches, shortness of breath, chest and back pains) as well as for chronic conditions such as heart disease, cancer, diabetes, lung disease etc. People who experienced intense regret secreted more cortisol and reported more acute physical symptoms than did those who experienced less intense regret.

Overall, regret had a negative impact on physical and mental health. Data from the second study confirmed the impact of regret on physical health, as people who reported high levels of regret intensity at baseline were reliably more likely to develop cold symptoms than those whose baseline measures of regret were less intense. Wrosch et al. (2007) also tested a writing intervention in their second study designed to encourage people to think constructively about their regrets. Writing about the regrets of other people, describing external contributing factors beyond their control, and identifying the importance and positive contribution to their own

lives of current and future goals had beneficial effects on those in the experimental (intervention) group. Relative to participants in a control group, who simply wrote about daily activities and intentions, the intervention group showed significantly lower levels of despair-related emotions as well as improved sleep patterns.

Because of the correlational nature of the studies described above any causal conclusions must be tentative at best, as it remains unclear just how regret, memory and subjective wellbeing interact. Nevertheless, these studies show some of the negative physical and mental phenomena associated with regret. The study by Wrosch et al. (2007) also suggests at least one way of countering these effects, but others have found that people also have natural ways of counteracting the negative impact of regret. Wrosch and Heckhausen (2002) found that older participants reported lower levels of regret intensity when they also reported having less control over regrettable events, possibly because they felt less responsible for their regretted experiences. The opposite pattern was observed in younger adults, who reported lower regret intensity the more they attributed internal control towards the regretted experiences. Wrosch and Heckhausen suggest that by attributing low internal control over their regrets older adults deactivate them, whereas attributing high internal control gives younger adults the feeling that they can do something about their regrets.

Age differences in dealing with life regrets were examined by Torges, Stewart and Nolen-Hoeksema (2008), who looked at the impact of unresolved regrets on the process of bereavement in young and old adults. Relative to the younger group, older adults were more likely to have resolved their regrets 6 months post-bereavement. They also scored lower on measures of depressive symptoms and rumination and had higher levels of wellbeing than younger adults

Wrosch, Bauer and Scheier (2005) suggest that naturally adaptive, self-regulating factors protect older people from regret. Younger people, they argue, have plenty of opportunities ahead of them to redeem their regrets, whereas older people face diminishing opportunities to undo their regrets and so disengage from them, a claim with strong echoes of Roese and Summerville's (2005) 'opportunity breeds regret' principle. In the first of two studies Wrosch et al. (2005) examined this hypothesis by comparing two age groups (18 –35yrs and 55-89 yrs) on measures of regret intensity, perceived opportunities to undo regrets, degree of disengagement from regrets, and on measures of quality of life (depressive symptoms and physical health). The results showed that compared with younger participants the older group perceived fewer opportunities to undo their regrets and reported more disengagement from their regrets. Moreover, older adults who reported high levels of regret intensity scored higher on depressive symptoms and poor physical health than their peers who reported low regret intensity. In the younger group, regret intensity was not strongly associated with wellbeing. These results were replicated in a second study, which also showed that among older adults, having future goals reliably predicted reduced levels of regret intensity and higher levels of life satisfaction, which as Beike, Markman and Karadogan (2009) point out, is at odds with Roese and Summerville's (2005) opportunity principle.

Stewart and Vanderwater (1999) showed that regret-inspired life changes also bring contentment. Women in midlife who had acknowledged their regrets and then implemented corrective behaviour (returning to education or starting a career) were higher in life satisfaction than women who reported regrets but did not actively engage in corrective behaviour. Torges, Stewart, and Miner-Rubino (2005) found that women who reported having no regrets scored higher on measures of life

satisfaction than those who did report regrets, but among those who reported regrets, higher levels of wellbeing were found in women who had either come to terms with their regret or had at least ‘put the best face on them’. Low levels of wellbeing were reported in those who had not managed to resolve their regrets in either way.

King and Hicks (2007) advocate a pragmatic approach to regret, which in their view is inevitable and so should be embraced as an opportunity for personal growth instead of being avoided at all cost. Mistakes and lost opportunities present people with important information about themselves, in particular about the “lost possible selves” they might have been. King and Raspin (2004) for example analysed the narratives of divorced women for references to failed goals and lost possible selves (i.e., the potential selves they envisaged when entering marriage). Women who tended to dwell on their lost possible selves reported lower subjective wellbeing than did women whose failed goals and lost possible selves were less salient in their narratives. The authors suggest that letting go of failed goals and the possible selves attached to them allows people to move on and develop their potential by embracing their revised visions of who they may become.

## **1.2 Regret and decision making**

Many regret researchers emphasise that regret is not just about bad things that happen but about bad things that people bring about through their own choices (Roese & Summerville, 2005; Zeelenberg & Pieters, 2007; Zeelenberg, van dijk, Manstead, & van der Pligt, 1998). Regret was incorporated into some early models of choice as it became clear that not only do people experience regret when their decisions lead to suboptimal outcomes, but they factor this knowledge into their decision about the future. In fact, much early regret research focussed on

prospective (anticipated) as opposed to retrospective (experienced) regret in an attempt to explain why people violate axioms of rational choice by making decisions that are inconsistent with a rational assessment of the odds. It became apparent to some (Bell, 1982; Loomes & Sugden, 1982; Sugden, 1985) that in conditions of uncertainty people make choices that are less to do with maximising utilities than they are to do with avoiding bad feelings such as regret or self-recrimination. The incorporation of 'irrational' affect into rational models of choice marked an important point of growth for both decision making and regret research (Zeelenberg, 1999).

#### *1.2.1 Anticipated regret*

Numerous experimental manipulations have tested the assumption that people make choices aimed at avoiding or minimizing regret, many of which exploit the specific role of feedback about chosen and foregone options. Simonson (1992) had students imagine themselves to be consumers in purchase scenarios involving choices between safe or risky options. In one study they chose either to buy items currently on sale (safe option), or to wait to see whether better bargains were available at a later date (risky option), and in a second study they chose between a known brand (safe option) or a cheaper, lesser known brand (risky option). The principal manipulation in both scenarios was the expectation (or not) of receiving feedback about the non-chosen option, a prime intended to increase the salience of anticipated regret. The manipulation worked in both cases: participants primed to anticipate regret (feedback group) were more likely than the control (no feedback) group to go with the safe options (buy from current sale items/choose named brand).



In both cases participants justified their decisions in terms of responsibility and self-blame.

In gambling experiments involving real monetary reward Josephs, Larrick, Steele and Nisbett (1992) looked at how people who were either high or low in self-esteem made decisions in the face of anticipated negative feedback about their decision outcomes. If feedback about bad decisions is self-implicating, they argued, then it should appear more threatening to individuals who perceive themselves as having fewer self-protecting resources. Participants chose between certain wins or speculative gambles (a certain \$10 versus a 50% chance of \$20) in the face of different feedback manipulations: in Experiment 1 everybody expected feedback on their chosen option; in Experiment 2 only half of participants did, and in Experiment 3 everyone expected feedback about their chosen option, but half of participants also expected feedback about the option they had passed up. The results of Experiment 1 confirmed that low self-esteem (LSE) individuals sought to protect themselves from self-implicating negative feedback, as they were significantly more likely to choose the safe (certain) option. High self-esteem individuals (HSE) on the other hand appeared less threatened by the implications of a bad decision and were 50% more likely than LSE participants to go for the risky option.

The manipulation in Experiment 2 did not influence the behaviour of HSE individuals, who were as likely to choose safe as risky options regardless of whether or not they expected feedback. By contrast, LSE individuals who did not expect feedback about their choices (and therefore perceived no threat) became just as risk-seeking as HSE individuals. The results of Experiment 3 showed that LSE individuals who anticipated feedback only on their chosen option did not differ significantly from HSE individuals in the same condition; but where feedback about

the foregone option was expected, LSE individuals were significantly more likely than HSE individuals to choose the safe option. All three experiments highlight how bad choices can be seen as self-implicating, but the third experiment shows how the perceived threat of regret is increased when knowledge about foregone options is available.

This point was illustrated by Zeelenberg, Beattie, van der Pligt and de Vries (1996) in three hypothetical gambling experiments which also manipulated feedback about foregone alternatives. In each of three conditions participants could choose a risky or safe gamble and in all three conditions they expected to receive feedback about their chosen option. In two conditions however there was the possibility of also receiving feedback about the option they had passed up, so people in the *risky condition* who chose a safe gamble received feedback on both options, and similarly, people in the *safe condition* who chose a risky gamble received feedback on both options. Only in the latter two conditions was regret likely, since participants learned what they would have won had they chosen differently. Participants also gave reasons justifying their choices. As predicted, people's choices indicated that they were avoiding potential regret, because people in the *risky condition* chose the risky option (thereby avoiding feedback about the foregone safe option) and people in the *safe condition* chose the safe option (thereby avoiding feedback about the foregone risky option). Examination of the participants' protocols also showed that anticipation of regret was mentioned frequently in their justifications for their choices.

Scenario studies show the influence of anticipated regret on people's gambling choices (Mellers, Schwartz & Ritov, 1999; Zeelenberg & Pieters, 2004) their negotiation strategies (Larrick & Boles, 1995), their decisions about medical

treatments (Ritov & Baron, 1995), and their investment behaviour in situations where foregone opportunities might be seized by a third party (Hoelzl & Loewenstein, 2005). Behavioural studies also support this scenario data. For example, Bar-Hillel and Neter (1996) conducted a series of studies in which students were given lottery tickets and then asked if they would be prepared to exchange them for new ones plus a small monetary bonus. Despite an expressed belief that their tickets had very little chance of winning, the majority of participants were reluctant to exchange them nonetheless, because of the regret they anticipated feeling if the original ticket turned out to be a winner. A recent account shows how this phenomenon might be explained by people's reluctance to 'tempt fate' (Risen & Gilovich, 2007; 2008).

In health and medical contexts the prospect of regret has been shown to bias people's judgement in decisions concerning both real (Asch et al., 1994; Meszaros et al., 1996; Ziarnowsky, Brewer & Weber, 2008) and hypothetical vaccinations (Baron & Ritov, 1994; Connolly & Reb, 2005; Ritov & Baron, 1990). The increasing involvement of patients in medical decision making is seen as a major source of potential regret (Brehaut et al., 2003) and the anticipation of regret is recognised as something likely to shape treatment choices. Brodensen, Sutton, Goff, Hodgson and Thomas (2004) asked people with a family history of colorectal cancer to anticipate the emotions that might follow from their decisions to undergo genetic screening or not. Screening establishes an individual's degree of risk and can determine the subsequent management and surveillance of the risk, so testing positive, although an unpleasant outcome, has potential health benefits, as well as implications for the decisions of other family members. The results of the survey showed that people anticipated feeling more regret and guilt from not having genetic screening (and

therefore not knowing whether they were at risk or not) than from being screened and subsequently testing positive.

Medical practitioners make consequential decisions with much potential for regret, remorse, guilt (Le Coz & Tassy, 2006) or regret-related feelings of ‘chagrin’ (Feinstein, 1985), and some medical decisions may involve choosing an ‘acceptable’ level of regret (Djubegovic, Hozo and McMasters, 1999).

In other domains research shows that anticipated regret may also have a positive influence on attitudes and behaviour. Anticipated regret can make people engage in safer sex (Richard, de Vries & van der Pligt, 1998) and can strengthen their intentions to implement health-related behaviours (Abraham & Sheeran, 2003;2004), possibly because it creates an association between the intention and potential for negative affect should that intention remain unfulfilled (Sheeran & Orbell, 1999). In short, people are regret-averse and their decisions reflect this, although under certain circumstances their curiosity for outcome knowledge can override this aversion (van Dijk & Zeelenberg, 2007).

### *1.2.2 The effect of regret on subsequent choice*

Behaviour is influenced as much by experienced regret as it is by the prospect of regret. Indeed, researchers who take a functional view of regret argue that one of its primary functions is preparatory, in that it helps people to learn from past mistakes and modify future behaviour (Roese, 1994; 2005).

Decisions that lead to regret make people regret-averse when faced with the same decisions again (Zeelenberg & Beattie, 1997), and measures of regret taken after a bad experience with a service provider (a taxi company or a restaurant) can predict the likelihood that a person will subsequently switch providers (Zeelenberg

& Pieters, 1999). Creyer and Ross (1999) found that scores on their regret experience measure reliably predicted the extent to which participants' subsequent choices were regret-minimizing, while Tsiros and Mittal (2000) showed that experiences of regret have an indirect negative effect on consumer repurchases.

The phenomenon of *inaction inertia* (Tykocinsky, Pittman & Tuttle, 1995; Tykocinsky & Pittman, 1998) is another example of how regret can spill over from one choice into a subsequent choice. People who forego an attractive opportunity are more likely to also forego a subsequent, less valuable but still objectively attractive opportunity, perhaps because the opportunity cues a memory of the previous experience of regret and triggers an aversive response (see also Arkes, Kung & Hutzel, 2002; Butler & Highhouse, 2000).

### 1.2.3 Regret and responsibility

The decision making framework necessarily associates regret with personal responsibility and some degree of self-blame (see Connolly & Zeelenberg, 2002), and the dimension of *self agency* was found to be one of the main features that distinguished regret (along with guilt and shame), from the related emotion of disappointment (Frijda, Kuipers & ter Schure, 1989). Zeelenberg, van Dijk, Manstead & van der Pligt (1998) found regret and disappointment to differ significantly on many other dimensions, but most strongly in terms of *action tendencies* (what an emotion makes people want to do) and *emotivational goals* (what the emotion makes a person want). Regret more than disappointment was associated with the action tendency to 'kick oneself' and 'correct the mistake', and with the emotivational goal of wanting to undo the event and get a second chance. This focus on the agent's own behaviour as the source of regret but not

disappointment was illustrated in a separate study (Zeelenberg, van Dijk, van der Pligt, Manstead, van Empelen & Reinderman, 1998) where people were asked what they would change about either an experience of regret or one of disappointment. People were more likely to undo some aspect of their own behaviour for regret, but some aspect of the situation for disappointment. Zeelenberg, van Dijk, Manstead & van der Pligt (1998) concluded that regret and disappointment differ fundamentally in that regret comes from realising that we have made bad choices whereas disappointment arises when expectations are frustrated by events beyond our control.

The centrality of responsibility to regret is a contested issue (see the exchange between Connolly, Ordonez, & Coughlan, 1997; Ordonez & Connolly, 2000; Zeelenberg Van Dijk, & Manstead, 1998, 2000). Landman (1993) suggests that responsibility may distinguish different states of regret but is not a defining feature of it, a view reflected in many philosophical attempts to draw distinctions between simple regret, agent-regret, guilt, and remorse (Baron, 1988; Rorty, 1980; Thalberg, 1963; Williams, 1976). A rather extreme (and potentially regrettable) position is taken by Zeelenberg and Pieters (2007), who consider responsibility to be a precondition of regret and have declared this unambiguously: “No choice, no regret” (p. 15).

### **1.3 Decisions and regret as a counterfactual emotion**

In Section 1.0 regret was described as a counterfactual emotion and the work reviewed on decision regret shows how the availability of knowledge about desirable foregone options can determine people’s choices and their responses to post-decision outcomes, as they compare what they have with what they might have had. The pervasive tendency to think about things that are ‘contrary-to-the fact’ (Chisholme,

1946) is a widely studied topic that has had a strong influence on the direction of regret research.

Counterfactual thinking involves mental simulations of alternative outcomes to reality (Kahneman & Tversky, 1982) and counterfactual thoughts are typically framed in ‘if only’ propositions. These comparisons are directional (Markman et al., 1993), so imagining a more favourable outcome (an *upwards counterfactual*) produces experiences of disappointment and regret (Bell, 1982; Kahneman & Tversky, 1982; Landman, 1987; Zeelenberg Van Dijk, & Manstead, 1998) as well as guilt and shame (Mandel, 2003; Niedenthal, Tangney & Gavanski, 1994), whereas a *downwards counterfactual* where a worse outcome is imagined produces relief or rejoicing (Gleicher, Kost, Baker, Stratham, Richman & Sherman, 1990; Guttentag & Ferrel, 2004; Landman, 1987; Loomes & Sugden, 1982). Counterfactuals are more spontaneously evoked by negative than by positive outcomes (Boniger, Gleicher & Stratham, 1994; Gavanski & Wells, 1989; Gleicher et al., 1990; Kahneman & Miller, 1986; Landman, 1987; Roese & Hur, 1997) though this is not always the case (Markman, Gavanski, Sherman & McMullen, 1993; Roese & Olson, 1993a,b; Roese & Olson, 1995).

Through their association with causal reasoning (Wells & Gavanski, 1989) and problem solving (Roese, 1994, 1997) reality-improving upward counterfactuals can help people to learn from their mistakes and modify future behaviour (Markman et al., 1993; Roese, 1994; Roese, Hur & Pennington, 1999), but they can also be dysfunctional if people make the wrong causal inferences and draw the wrong conclusions about how to improve future behaviour (Sherman & McConnell, 1995).

According to *norm theory* (Kahneman & Miller, 1986) counterfactuals are spontaneously and automatically evoked by surprising events, as the imagination

attempts to reinstate normality by mutating the highly available alternatives brought to mind by the evoking event itself. Counterfactual thoughts may also involve elaborative, self-initiated reflections about once possible lives (Kahneman, 1995) or once possible selves (King & Hicks, 2007), but whether automatic or elaborative they tend to concern only events that were once deemed possible. Unlike ‘free form’ fantasies, counterfactual thoughts adhere to natural laws (Seelau, Seelau, Wells & Windschitl, 1995) and people tend not to mentally undo events by mutating the laws of gravity, causation, or time. Indeed, the counterfactual imagination is thought to be a rational faculty operating in relatively predictable ways (Byrne, 2005), gravitating naturally towards some features of a situation more than others.

Counterfactual statements such as ‘If only I’d gone to university I’d have a better job by now’ imply a causal relationship between a university education and successful employment, and counterfactual causal reasoning is quick and spontaneous following unexpected events (Hassin, Burgh & Uleman, 2002) and has been manipulated in numerous scenarios (Mandel & Lehman, 1996; N’gabala & Branscombe, 1995; Roese & Olson, 1996; Wells & Gavanski, 1989; Wells, Taylor & Turtle, 1987). Counterfactual causal attributions are often made even when two events are not causally linked: when faced with two tosses of a coin that lead to a loss of money, people tend to undo the second toss and ascribe more blame to the person tossing the second coin (Miller & Gunasegaram, 1990).

In scenarios where a sequence of events prevents a character from arriving home in time to save his dying wife, people tend to undo an event perceived to be controllable (stopping at a bar on the way home) more than they undo an uncontrollable event, such as a flock of sheep blocking the road (Giroto, Legrenzi & Rizzo, 1991). When the character is delayed by a series of events that are all



controllable, people tend to undo those events deemed to be socially unacceptable (stopping for a hamburger) more readily than socially acceptable events, such as stopping to visit family (McCloy & Byrne, 2002).

Exceptional events are more readily mutated than routine events (Kahneman & Tversky, 1982; Miller & McFarland, 1986; Wells et al., 1987) and people who have suffered traumatic injury may focus on atypical aspects of the circumstances in which they were injured (Davis, Lehman, Silver, Wortman & Ellard, 1996). Events that are easily imagined otherwise might appear unnecessary and lead people to think that they *ought not* to have happened (Miller & Turnbull, 1990).

### *1.3.1 Agency and counterfactual thinking*

Of central importance to this thesis is the relationship between regret and agency, and much of the work on the nature of that relationship comes from counterfactual thinking research dealing explicitly with the role played by agency in determining the affective response to decision outcomes. This work will now be considered.

The emotional consequences of counterfactual thoughts are gauged by an entirely subjective yardstick and may sometimes seem counterintuitive: an Olympic athlete for example may experience more regret after winning a silver medal than the athlete who wins the bronze. Although a silver medal is objectively better than a bronze, the desired outcome (a gold medal) seems relatively closer to the silver medallist than it does to the bronze medallist (Medvec, Madey & Gilovich, 1995). The ease with which such alternatives come to mind amplifies the affective response (Kahneman & Miller, 1986) and it is at this point, where objectively similar outcomes produce (or are expected to produce) very different emotional responses,

that the overlap between counterfactual thinking and regret research is most apparent. Kahneman and Tversky (1982) have illustrated this ‘emotional amplification’ effect in many frequently cited scenarios studies. They showed for example that someone who misses a flight by five minutes is expected to feel more upset than someone missing the same flight by thirty minutes, because of the relative ease with which each scenario can be reversed. With regard to counterfactual thinking and regret, one of Kahneman and Tversky’s most influential studies concerns the role of agency in determining an individual’s affective response to a bad outcome.

In a frequently cited and replicated study, Kahneman and Tversky (1982) presented a scenario involving two investors, George and Paul, who, for different reasons, find themselves \$1200 worse off than they could have been. George misses the opportunity as a consequence of his actions (buying new stock when he would have profited from sticking with existing stock) while Paul misses out through inaction (by holding on to his original stock when buying new stock was the profitable option). Although the outcome is the same for both men, when asked to estimate who would feel more regret, 92% of people opted for George, the actor. Kahneman and Tversky (1982) explain this attribution of greater regret for the actor as being due to the relative ease with which the alternatives can be imagined. In their view a state of inaction is the norm or default setting and so an action deviates from normality. It is easier therefore to imagine George reversing the action and restoring normality than it is to imagine undoing Paul’s situation from inaction to action.

This ‘action effect’ has been replicated many times and for both negative and positive outcomes in many cases using modifications of Kahneman and

Tversky's (1982) switch/stay scenario (Baron & Ritov, 1994; Connolly, Ordóñez & Coughlan, 1997; Ritov & Baron, 1995; Gleicher, Kost, Baker, Stratham, Richman & Sherman, 1990; Landman, 1987; Zeelenberg, van Dijk & Manstead, 1998). It has also been shown to be sensitive to a number of manipulations and can depend on such things as whether an action is consistent with a person's personal orientation (Seta, McElroy & Seta, 2001), whether information about prior (Zeelenberg, van der Bos, van Dijk, & Pieters, 2002) or alternative (Ritov & Baron, 1995) outcomes is available to the decision-maker, whether an outcome is seen as reversible (Abendroth & Diehl, 2006), and whether the decisions being judged are presented in a within- or between-subjects design (N'gbala & Branscombe, 1997; Zhang, Walsh & Bonnefon, 2005). The action effect continues to be explored in scenario studies (Byrne & McEleney, 2000; Feeney & Handley, 2006; Walsh & Byrne, 2007; Zeelenberg, van der Bos, van Dijk & Pieters, 2002). By locating regret within a decision-making framework and emphasising the role of counterfactuals, Kahneman and Tversky's (1982) vignette studies shaped the way subsequent regret research was conducted, even when researchers adopted a different tack and moved away from laboratory studies and into the field to examine people's actual autobiographical regrets.

### *1.3.2 Agency and autobiographical regrets*

The action effect found in experimental studies using scenarios appeared to Gilovich and Medvec (1994) to be at odds with anecdotal evidence suggesting that people tend to regret things they haven't done more than things they have done. Indeed, existing survey data already indirectly supported this intuition. Kinnear and Metha (1989) for example surveyed people in three age groups (20s, 35-55yrs, and

65+) about their major regrets by asking them to think about what they would *do* (emphasis added) differently if they had their lives to live over again. Although the action-inaction distinction was not part of the survey, the framing of this question appears to assume inaction as the default for life regrets. This assumption is even more apparent in the items respondents were asked to select from, which included statements such as “I would have been more assertive”; “I would have taken care of my health more” (p. 184). In a ‘life revision’ survey DeGenoa (1992) reflects similar assumptions; respondents were presented with a list of 35 activities (such as being with friends, working, and developing spirituality) and asked to indicate how much time they would spend on each one if they had their lives to live over again, the implication being that people would feel they had not done enough of these activities the first time round.

Gilovich and Medvec (1994) tested their intuitions in two telephone surveys and an interview-survey study. In their first study they assessed the prevalence of both types of regret by asking people whether they most regretted things they had done but wished they hadn’t (actions) or things they hadn’t done but wished they had (inactions). In the second study they asked people to recall their greatest regret of action and their greatest regret of inaction and then to decide which they regretted most. The results showed that more people regretted inactions than actions (Study 1) and more regret was attributed to inaction than to action regrets (Study 2). A subsequent study combining face-to-face interviews and questionnaires also found inaction regrets to predominate.

This temporal pattern (the *inaction effect*; Zeelenberg, van der Bos, van Dijk & Pieters, 2002) is a robust finding in studies involving autobiographical regrets. It has been demonstrated in the general population (Feeney et al., 2005; Feldman,

Miyamoto & Loftus, 1999), among the intellectually gifted (Hattiangadi et al., 1995), and in several cultures (Bonnefon, & Zhang, 2008; Gilovich et al., 2003; Jokissari, 2003; Timmer et al., 2005).

#### **1.4 Regret's temporal pattern: Gilovich and Medvec's (1995) account**

One comprehensive account of the inaction effect is Gilovich and Medvec's (1995) elaboration of their earlier position (Gilovich & Medvec, 1994), which proposes that several psychological and motivational factors operate over time to make people feel better about their regrettable actions and worse about their regrettable inactions. The first factor assumed to mitigate the pain of regrettable actions more than regrettable inactions is people's tendency to engage in compensatory behaviours following actions (Gilovich & Medvec, 1994). The second factor concerns the tendency to seek silver linings and reduce cognitive dissonance. Gilovich, Medvec and Chen, (1995) argued that because regrettable actions are more painful in the short term they motivate pain-reducing cognitions more quickly. Furthermore, they argued that dissonance reduction is greater for actions than for inactions because emotional amplification is greater for actions than inactions (Kahneman & Miller, 1986) and is more closely associated with responsibility than is inaction. They demonstrated this in an experiment which used a 'stay/switch' format from a well known game show (the "Monty Hall" problem). Three prizes of different value are concealed in three boxes; there are two 'moderate' prizes and one 'grand' prize. Participants first choose one of the three boxes, the content of which is unknown. The experimenter then opens one of the two remaining boxes to reveal a moderate prize. The tension of the game rests on whether the grand prize lies in the box participants have chosen, or in the third

unopened box. Participants are given the choice of switching to the third unknown box (action) or staying with their original choice (inaction). The experimental manipulation ensures that participants never get the grand prize, so the issue is whether the bad outcome (not getting the grand prize) is achieved through action (switching) or inaction (staying). Dissonance reduction in this study was operationalised as the amount of post-decision rationalisation participants engaged in, and it was measured by asking them to say how much they would be willing to sell their moderate prize for. Those who had obtained the prize by switching (action) ascribed greater value to it than those who had obtained the same prize by staying (inaction). That is, participants compensated for their loss by inflating the value of the obtained outcome, and faced with a suboptimal outcome, rationalized it by saying, 'it wasn't so bad actually'.

These factors ensure that action regrets are more quickly dealt with than inaction regrets. At the same time Gilovich and Medvec (1995) propose that three factors also ensure that regrettable inactions become more painful over time. The first factor is an increase in subjective confidence with increasing distance from an event, as shown in studies by Gilovich, Kerr and Medvec (1993) in which students' judgements of both prospective and retrospective confidence were mediated by whether an event was due to occur (or had occurred) in the near or distant future. In a study of retrospective confidence college alumni and current undergraduates were asked to estimate the impact on various aspects of their lives of an increased workload during a typical semester. Alumni, who had been out of college on average for three and a half years, were significantly more confident than current undergraduates that they could have taken the extra workload in their stride. Gilovich and Medvec (1995) suggest that this increase in subjective confidence

makes distant failures to act appear inexplicable, as people overestimate their capacity at the time. A related factor cited by Gilovich and Medvec (1995) is the differential recall of compelling over inhibitory features of the antecedent circumstances; compelling forces are more salient in memory than are restraining forces.

Things we regret not doing also seem to represent a blank canvas of possibilities for what 'might have been' whereas the immutable fact of a regrettable action leaves the imagination fewer degrees of freedom. Finally, because incomplete tasks are better remembered (the "Zeigarnik effect", Zeigarnik, 1935), the open-ended nature of inaction regrets means they are more frequently rehearsed and given preferential status in memory.

These claims are supported empirically. Savitsky, Medvec and Gilovich (1997) tested for the Zeigarnik effect by measuring the frequency of recall and availability (ease of retrieval) of action and inaction regrets. Inaction regrets were found to be more often the focus of rumination, more easily recalled, and more likely to be perceived as unfinished business. Rajagopal, Raju and Unnava (2005) found reduced accessibility for action regrets over time, which they suggest might account for the temporal pattern of inaction regrets. They also found that the consequences of inaction regrets were broader (affecting more domains) and deeper (more consequences) than action regrets and that inaction regrets were more frequently thought about.

Gilovich and Medvec (1994, Study 4) reconciled the survey data with the experimental literature by demonstrating that regrets change over time. They presented people with two scenario studies involving students who find themselves in a bad situation; one due to action and the other due to inaction. When asked which

of the two characters (actor/non-actor) would feel most regret in both the short- and long-term, participants judged that the actor would feel most regret in the short term, but that the person who had failed to act would feel more regret in the long term. This finding was consolidated in a final interview study in which people were asked to think of both a short-term regret (from the previous week) or a long-term regret (from their entire lives) and say which they regretted more. Whereas short-term regrets were as likely to be attributed to actions as inactions, regrets from across the lifespan were overwhelmingly attributed to inactions.

#### *1.4.1 Summary and evaluation*

The work reviewed thus far offers compelling reasons for treating regret as a decision-making variable: it shows that the anticipation of regret influences people's choices, that experiences of regret are factored into subsequent behaviour, that people can readily identify sources of regret in scenarios involving the decisions of other people, and that people often express their autobiographical regrets in terms of bad decisions. There can be little doubt that regret is inherent in decision making, but it does not necessarily follow that all regrets come from decisions or that all decisions are made with potential regret in mind, and it is surely overstating the case to say, as Zeelenberg and Pieters (2007) have done, 'no choice no regret'. Much of the research on decision regret draws on situations (hypothetical or real) where choices and their outcomes are relatively clear, whereas many of life's choices are neither clear, straightforward, nor even conscious choices as such, something reflected in Connolly and Reb's (2005) operational definition of a *decision* as anything from an extensively deliberated choice to a choice involving little or no conscious thought.



A point often overlooked in the decision-making approach to regret is that much regrettable behaviour is driven by what Lowenstein (1996) calls ‘visceral factors’ such as hunger, sexual drives, moods, emotions, addictions or physical pain. In the grip of such states people often have no control over their behaviour and Lowenstein argues that decision theorists have not adequately dealt with “decisions occurring at the hot end of the continuum defined by the intensity of visceral factors” (Lowenstein, 1996, p. 274). The same criticism could be made of regret researchers. So while it may be true in a purely deterministic sense that a person is the sum of every choice they ever made, more realistic distinctions are needed. People often express regrets in characterological terms (‘I regret being indecisive’) and so it might be necessary to distinguish such regrets from decision regrets in the same way that shame has been distinguished from guilt on the basis that the person feeling guilt wishes to undo aspects of their behaviour, whereas people feeling shame are more inclined to wish to undo aspects of who they are (Niedenthal, Tangney & Gavanski, 1994). In this sense it might be valid to speak of indecision or apathy regret.

According to Zeelenberg and Pieters (2007) the average person makes a couple of thousand decisions in the course of a day, from choosing breakfast to choosing careers. Some of these decisions doubtless contribute to subsequent regret, but many are automatic, barely enter consciousness, or are quickly forgotten if they do, particularly decisions that do not involve other people (White, 1982). Someone who regrets becoming obese may not be aware of the 200 or so food-related decisions they overlooked every day, many of which were opportunities to say ‘no’ (Wansink & Sobal, 2007). An important factor missing from the decision-making framework is that what remains to be regretted is determined largely by what can be remembered or reasoned about the past. Someone who has recently left school with

poor grades may be able to recall many instances when they wasted opportunities to improve their performance, but by the time that same person reaches retirement, they may only remember *that* they missed those opportunities. The thesis being advanced is that a fuller understanding of regret requires that such factors be taken into account, so in order to understand how different regrets are remembered, consideration will now be given to the recollective and reasoning processes of AM that shape what we end up regretting.

### **1.5 Regret as autobiographical memory**

Technical definitions of autobiographical memory abound in the literature (see Brewer's comprehensive summary, 1986;1996) but for the purpose of this thesis a working definition is adopted from Conway and Rubin (1993), who define autobiographical memory simply as 'memory for the events of one's life', which includes memory for personally experienced events and knowledge about the self. Most current models of autobiographical memory are *reconstructive* (Conway & Pleydell-Pearce, 2000; Schacter & Addis, 2007; Schacter, Norman & Koutstaal, 1998), which is to say that memories are not viewed as discrete units or literal records retrieved from a store, but rather as transitory "patterns of activation" derived from an underlying knowledge base and brought into consciousness during retrieval processes mediated by a central executive system (Conway & Pleydell-Pearce, 2000).

Rubin (1996) suggests that definitions should be allowed to emerge from the 'natural cleavages' found by researchers, and Robinson (1992) uses two such cleavages to reduce the complexity of autobiographical memory phenomena to two broad dimensions of contrast. A structural dimension spans a continuum from

highly specific to very abstract general events, while the phenomenological dimension distinguishes what we remember from what we simply know about ourselves (Tulving, 1985). These distinctions overlap and intersect at many points and are frequently used interchangeably, but the approach taken here is to acknowledge the existence of a fuzzy boundary and proceed with this in mind. The structural distinction occupies the greater part of the following literature review, as it is central to the distinction that will be made in this thesis between regrets for specific and general events. However, the phenomenological distinction also makes some important contributions, which will be considered in the General Discussion, so it is also briefly reviewed.

#### *1.5.1 The structural distinction*

Early attempts to establish how knowledge might be structured in memory came out of computational models based on the idea that experience is organised according to *scripts* (Schank, 1982; Schank & Abelson, 1977), which are mental representations of stereotyped action sequences for everyday situations such as eating in a restaurant. A script has slots for the props, actors and actions found in a restaurant situation and it specifies how these slots are filled and the causal sequence in which events occur. In Schank and Abelson's (1977) model scripts were thought to be discrete structures acquired episodically: people were assumed to have hundreds of *personal* and *situational* scripts to cover the activities of daily life. A drawback of this strictly episodic model however was its inability to accommodate generic scripts for situations which could not logically derive from a single discrete experience. Bower, Black and Turner (1979) highlighted this flaw in an experiment that showed how people can erroneously 'remember' an action sequence simply

because it is implied by an underlying script. Such ‘script confusion’ prompted Schank (1982) to develop a more dynamic, *reconstructive* view of memory with a hierarchically structured knowledge base acquired through the “successive abstraction” of scripts from repeated exposure to events of a similar nature. Other computational models posited similar organisational structures and processes (Koldoner, 1983a,b) but these accounts were never empirically tested and so most of what has been discovered about the organisation and structure of autobiographical memory comes from asking people questions designed to probe the structure and organisation indirectly.

Linton (1986) explored the content and structure of her own autobiographical memory in a diary study lasting six years, during which time she recorded and subsequently tried to recall hundreds of events from her life. One of her key findings was that her own autobiographical knowledge was hierarchically organised at different levels of abstraction, from the most general level of emotional valence (*mood tone*), which simply designates experiences as good or bad, to the highly specific fine-grained perceptual *details* that constitute the *elements* of discrete *episodes*. In between these extremes are more or less general levels of thematically related and temporally extended experience.

Barsalou (1988) abstracted a comparable hierarchy from the autobiographical memories of college students asked to recall *events* from their summer break. Three distinct categories of experience emerged from the student’s descriptions: *extended events* (a holiday abroad), *summarised events* of repeated experiences (watching a lot of television) and *specific events* (going to the theatre). An unexpected outcome of this analysis was the discovery that summarised events accounted for about a third of all descriptions provided, whereas specific events made up only about a fifth of all

responses. On the basis of computational models Barsalou (1988) had expected autobiographical memory to be structured around specific events, so he re-ran the study using a more directed method involving precise definitions of specific and summarised events and explicit instructions to provide only specific events. Participants were also reminded of the definitions if it was noted that they were not providing specific events. Despite the precise definitions and experimenter intervention and guidance, there was an almost irresistible tendency to describe summarised and extended events.

In a subsequent study Barsalou's (1988) students recalled events from their summer break in response to cues they had provided two weeks earlier, after which they designated each event as specific or summarised according to definitions provided. Again summarised events made up the majority (60%) of the descriptions supplied. These findings suggested a major organising role in autobiographical memory for general events, which Barsalou (1988) confirmed by analysing the events in his studies in terms of organising clusters. He found a clearly hierarchical structure which he described as *partonomic*, meaning that events at one level are *part of* events at higher levels (as opposed to being merely *similar too* them in a categorical sense). At the most abstract level of Barsalou's (1988) hierarchy are *extended event time lines*, which are structures representing discrete, temporally extended chapters describing the major life events such as *school*, *work*, and *relationships*. Within these chapters are *extended events* such as 'law school' (*school*), 'working as a law clerk' (*work*), and 'first marriage' (*relationships*). *Extended event time lines* can and do run parallel and the *extended events* within them are chronologically ordered. Being at law school can overlap with working as a law clerk and being married. Within *extended events* are *repeated* or *summarised*

events. Although Barsalou's (1988) model stops at the general event level, specific events would be part of these extended events.

Although Linton (1986) and Barsalou (1988) use idiosyncratic terms and describe slightly different structures, they both identify a hierarchical template that was confirmed in Conway and Rubin's (1993) review of the literature, which concluded that autobiographical knowledge could be represented at three broad levels of specificity; *lifetime periods*, *general events*, and *event-specific knowledge*. The most abstract and inclusive category of knowledge represents *lifetime periods*, which are similar in character to Barsalou's (1988) *extended event time lines*, Linton's (1986) *extendures*, Schooler and Herrmann's (1992) *periods*, and McAdams' (1985) *chapters*. These chapter-like divisions contain knowledge of events spanning months or years and as Barsalou (1988) notes are organised around themes such as education, work or relationships, which may overlap ('When I worked at X' overlaps with 'When I was married to Y'). Lifetime periods may also be related by what Barsalou (1988) describes as the logic of goal attainment, which means that an extended event can be partitioned into the sequential stages of a goal; a lifetime period representing an academic career might be represented as a sequence beginning with the undergraduate years, the doctoral period, post-doctoral research, lectureships and ending with a professorial chair. Goal attainment in one lifetime period can also facilitate goal attainment in another; securing one's first lectureship might enable one to put down a deposit on a house for example. A lifetime period might also encapsulate an attitude deemed important to the development of the self, such as a particular period remembered as being 'a difficult time' (Conway & Pleydell-Pearce, 2000). Lifetime periods are known to be superior cues, facilitating quick access to specific events in the autobiographical memory knowledge base

(Brown, Shevell & Rips, 1986; Conway & Bekerian, 1987). Barsalou (1988) observed that many of his participants used these extended events to structure their descriptions, sketching out a sequence of extended events which were subsequently returned to and fleshed out in detail. He considered this level of event knowledge to be an efficient way of summarising a person's history, something that has been confirmed by narrative models of autobiographical memory (Bluck & Habermas, 2000).

The next category contains thematically linked *general events* spanning periods from days to months. Events at this level may represent composite memories abstracted from many related experiences, described as *categoric* ("Times I have fallen downstairs"; Williams & Dritschel, 1992) or *summarised* ("late night parties"; Barsalou, 1988) events. *Extended events* might feature self-contained personal histories ("holiday with Jenny"; Conway & Bekerian, 1987) which Schooler and Herrmann (1992) call *episodes* and which Linton (1986) refers to as both *episodes* and *events*. Another type of general event is made up of multiple superimposed instances of a single episode which Neisser (1981) termed *repsisodes*. These repeated experiences have become amalgamated into one representation that might 'stand for' a certain type of experience and might be remembered as a discrete event. General events are highly accessible, as Barsalou (1988) discovered, and this has led Reiser, Black and Abelson (1985) and (Conway, 1992) to suggest that they represents a *basic level* category of knowledge, which is considered to be the optimal level at which concept knowledge can be represented (Rosch, Mervis, Gray, Johnson, Boyes-Braem, 1976 ). Categories at the basic level are neither too abstract nor too detailed to be functionally useful.

The most concrete level of the hierarchy contains varying degrees of detailed event-specific knowledge spanning from minutes to hours, though usually referring to experiences occurring within the space of a single day. Events at this level have been called *details* (Linton, 1986; Tulving, 1972), *moments* (Schooler & Herrmann, 1992) or *phenomenological records* (Conway, 1992). What characterises events at this level is that they are typically accompanied by imagery and other perceptual details (Brewer, 1986; 1996; Rubin, 1996) and although such events do not usually make effective retrieval cues under normal circumstances (Conway & Bekerian, 1987; Reiser et al., 1985) they may be vividly remembered when they concern exceptionally shocking (Brown & Kulik, 1977) or personally important (Pillemer, 1998; Rubin & Kozin, 1984) events.

Neisser (1988) describes the organisation of autobiographical knowledge in similar terms to Barsalou (1988), though he chooses the ecologically derived term ‘nested’ to describe how one event can be nested within another. Whatever the terminology, there is consensus that autobiographical memory is structured such that larger events contain smaller events at all levels of the hierarchy.

The distinction between specific and general events has applications beyond its theoretically important role as an organising dimension in autobiographical memory. Event specificity is central to word-cue studies that require participants to describe a discrete event that can be pinpointed in time and space (Crovitz & Schiffman, 1974), and this method has been particularly useful in assessing whether amnesic patients can recall remote specific events (see Kopelman, 1992 for a review). The specific-general dimension is integral to AM questionnaires used for clinical examination (Borrini, Dall’ora, Della Sala, Marinelli & Spinnler, 1989; Kopelman, Wilson & Baddeley, 1989) and the distinction is used extensively to



study the phenomenon of overgeneral memory, which is the observation that certain people suffering from affective disorders have difficulty in retrieving specific events (Williams, 1996; Williams, Barnhofer, Crane, Hermans, Raes, Watkins & Dalgleish, 2007; Williams & Broadbent, 1986; Williams & Dritschel, 1992). Often the distinction is applied post hoc to memories produced without constraints and it is a central feature of studies examining the characteristics of self-defining memories (Singer, Rexhaj, & Baddeley, 2007; Singer & Salovey, 1993).

### 1.5.2 *The phenomenological distinction*

In a landmark study of autobiographical memory Tulving (1972) introduced a distinction between memory for personally experienced events, which he called *episodic memory*, and memory for factual knowledge, which he called *semantic memory*. The original distinction rested on the nature of the information associated with each type of memory. Episodic memory (considered synonymous with autobiographical memory) was described as processing “information about temporally dated episodes or events, and temporal-spatial relations among these events” (p. 385) and semantic memory as processing “information about meanings of words, concepts, and classification of concepts” (p. 402). Subsequent revisions (Tulving, 1985a) associated the two types of memory with unique states of consciousness. Episodic memory came to be defined by the *recollective experience* and its accompanying state of *autonoetic* (self-knowing) consciousness, which “allows an individual to become aware of his or her own identity and existence in subjective time that extends from the past through the present to the future” (p. 388). Recollection by this definition is remembering in the everyday sense of mentally re-living past events. Semantic memory on the other hand does not involve self-

recollection or mental time travel; it is temporally bound to the present and it processes decontextualised abstract knowledge. Semantic recall is accompanied by *noetic* or (knowing) consciousness which gives rise to a feeling of familiarity or knowing.

In support of this distinction Tulving (1985b) devised what became known as the “remember/know” (RK) paradigm, which is a method for experimentally measuring a person’s conscious state at the time of retrieving a memory.

Participants are asked to indicate whether they *remember* some previously presented stimulus item, or whether they simply know it to have been previously presented “on some other basis” (Tulving, 1985b, p. 8). A *remember* response indicates that the person retains some episodic information about their encounter with the item (its physical appearance, some feature of the room, or what they were thinking for example), whereas a *know* response indicates that they recognise the item without having any conscious recollection of their encounter with it. Gardiner (1988) formally operationalised the RK definitions and this basic paradigm has been widely tested on a number of variables (see Gardiner & Java, 1991; Gardiner, Ramponi & Richardson-Klavehn, 1998; Rajaparam, 1993; and Gardiner, 2001) and there is strong evidence that the two systems are dissociable. The episodic-semantic distinction has made a huge contribution to the understanding of human memory and consciousness, and the autonoetic experience in particular is thought to be the capacity that distinguishes humans from animals (Suddendorf & Corballis, 2007). But the distinction has been challenged (see Tulving, 2002) and there is considerable debate surrounding the nature of episodic memories and the recollective experience (see Hoerl & McCormack, 2001). One challenge to the distinction is the observation that ‘false memories’ for events that have never happened are often accompanied by

the recollective experience and are often rich in episodic detail (Conway et al., 1996).

### **1.6 Changes over time: summarisation and semanticisation**

The organisation of the autobiographical memory knowledge base and the episodic-semantic distinction both imply a change over time in the way events are represented, shifting from specific to general with temporal distance. Tulving (1985b, Experiment 2) found a decrease in episodic but not semantic retrieval after a period of only seven days between encoding and retrieval. The summarisation of individual episodes gives way to abstract schemas (Bartlett, 1932) or scripts (Schank, 1982; Schank & Abelson, 1977). Linton (1982) described how her own memories became *semanticised* as details of specific episodes gave way to generic memories. After many years of attending board meetings in a distant town she was unable to recall any specific meeting, but she retained much semantic knowledge about the meetings in general and could describe the committee members and predict their interactions.

Conway, Gardiner, Perfect, Anderson, and Cohen (1997) found that over periods of weeks, psychology undergraduates shifted from predominantly episodic remembering to predominantly semantic knowing as they recalled the content of introductory lectures and research methods classes.

Developmental research also supports these findings. Nelson (1978) found evidence that children as young as four rely on generalised scripts for routine situations such as eating lunch, using these scripts to structure their knowledge of sequence and roles in different mealtime situations (at a day care center, at home, at McDonalds). Nelson also observed that scripted knowledge evolves over time:

children new to a day care center produced far fewer scripted propositions when describing events such as eating lunch, than they did when tested three months later.

Hudson and Nelson (1986, Study 1) asked 3- and 5- year old children to describe two events (a snack at day camp or dinner at home) in response to either a general (“What happens when you have a snack at camp?”) or specific (“What happened when you had a snack at camp yesterday?”) question. Children of both ages provided more information in response to the general question than to the specific one and appeared to have difficulty in providing episodic details. Hudson and Nelson (1986, Study 2) compared the general and specific memories of 3-, 5-, and 7- year olds and found that repeated exposure to a particular type of experience (such as a trip to the zoo) led to a gradual reduction in the amount of episodic detail and a greater reliance on the general scripted structure. Nelson and Gruendel (1981) showed that children readily summarise two similar events, and similar summarisation has been experimentally produced in studies of adults: Watkins and Kerkar (1985) showed that the recall of a twice presented item produced generic memories that were independent of either individual event.

#### *1.6.1 Temporal gradients and impairments of autobiographical memory*

The studies cited in the previous section provide evidence of how the structure of autobiographical knowledge changes from specific to general over time in children and healthy adults, but much has also been learned from clinical studies describing impairments of autobiographical memory, and numerous cases are reported of patients whose recall of remote episodic memories is impaired but who have relatively spared recall of remote semantic knowledge. A particularly dramatic case of this temporally graded amnesia is described by Tulving, Schacter,

McLachlan and Moscovitch (1988) whose patient K.C. suffered dense amnesia after an accident which left him unable to recall a single episode from his entire life, even personally meaningful events such as his brother's death from drowning. Yet K.C. retained personal semantic knowledge from his remote past and could say which school he had attended, who he had worked for, and that his family had owned a summer cottage which he had visited on many occasions, though he could not recall a single instance of having been there. Another remarkable aspect of K.C.'s condition was that he could also not imagine specific future events.

Equally dramatic is a case reported by Butters and Cermak (1986) of an eminent and widely published scientist (P.Z.), who only 3 years prior to the onset of alcohol-related amnesia had written his autobiography. When P.Z.'s memory for autobiographical events was tested using stimuli from both his academic and autobiographical writings, he showed severe loss of episodic memories for events in his recent past (including his autobiography) with relatively spared recall for semantic knowledge from early adulthood, including scientific definitions previously known to him. Many other cases of temporally graded amnesia are documented (see also reviews by Kapur, 1999; Wheeler & McMillan, 2001) and Conway and Fthenaki (2000) review several studies which show extensive preservation of remote events at the level of lifetime periods and general events but very poor retention of specific events. Cermak (1984) proposed that episodes become de-contextualised over time and result in a *semanticised* remote past that we 'know', and an episodic recent past that we remember.

In non-clinical populations temporal gradients have also been observed: Piolino, Desgranges, Benali and Eustache (2002) used a sophisticated questionnaire to examine temporal changes in the episodic-semantic components of

autobiographical memory in a sample of 40 to 79 year olds. They found less stable recall over time for specific (episodic) events, than for general (semantic) events and overall recall for specific episodes was poorer than for general semantic events in the remote past. Pillemer, Goldsmith, Panter, and White (1988) found similar temporal patterns in a study of college alumni from three different age periods (2, 12, and 22 years since graduation), who freely recalled important events from their first year in college. A principal finding was that the proportion of specific events decreased over time, with significantly fewer specific events reported by the older alumni.

That distant events are more generally represented in memory appeals to common sense, but this idea is also central to Trope and Liberman's (2003) theory of temporal construal, which draws analogies with visual perception to describe how detail fades as distance from an object increases, while the general form becomes more prominent. By this account remote events are represented schematically, whereas temporally near events are more concretely represented. Temporal construal will be recruited as an explanatory variable in subsequent chapters of the thesis, but for now the focus moves from the influence of the phenomenological and structural properties of autobiographical memory to a consideration of the equally important role of emotion.

## **1.7 Emotion and autobiographical memory**

Reviews suggest a complex relationship between emotion and memory (Christianson & Safer, 1996; Levine & Pizarro, 2004; Schooler & Eich, 2000). Emotion is strongly associated with the progress or obstruction of goals (Conway & Pleydell-Pearce, 2000; Singer & Salovey, 1993) and is central to autobiographical experience, but it plays a very limited role in organising autobiographical

knowledge. Specific memories take longer to retrieve in response to affect cues than they do to activity and object cues (Robinson, 1976) or lifetime periods (Conway & Bekerian, 1987), and although Linton (1986) placed valence at the top of her hierarchy, she found emotion labels themselves to be very poor memory cues, as others have also found (Beike, Adams & Wirth-Beaumont, 2007; Reiser, Black & Abelson, 1985).

Emotion does make some events more memorable than others, but again the relationship is not straightforward. Diary studies of everyday events show either enhanced recall of emotional over nonemotional events (Brewer, 1988; Wagenaar, 1986) or no difference (Linton, 1982; White, 1982). Research in the domains of eyewitness memory (Christianson, 1992), ‘flashbulb memories’ (Brown & Kulik, 1977; Conway, 1995) and memory for traumatic personal events (Christianson & Safer, 1996; Schooler & Eich, 2000) shows that certain types of emotionally arousing events can leave vivid and enduring memories. On the other hand, emotional arousal can also impair eyewitness memory (Kassin, Ellsworth & Smith, 1989), personally traumatic events can be completely forgotten (see Schooler & Eich, 2000) and vividly recalled flashbulb memories can acquire many reconstruction errors over time (Neisser & Harsch, 1992; see Conway, 1995 for a review).

### *1.7.1 Remembering negative events*

Of interest to an autobiographical memory approach to regret is how negative events are remembered and the evidence suggests that they are not remembered well: Linton (1982) noted that fewer than 13% of the memories she recalled were of specific negative episodes, and even events she described as “world-shaking” evaded

recall. People are inclined to recall pleasant more than unpleasant events (Brewer, 1988; Ehrlichman & Halpern 1988; Matlin & Stang, 1978; Thompson, Skowronski, Larsen & Betz, 1996), and according to Walker, Skowronski and Thompson (2003) this effect is not due to searching biases, as it is observed for involuntary memories (Berntsen, 1996), nor is it a general retrospective bias, as it is also found in diary studies (Thompson et al., 1996). While many studies exist showing the opposite effect, with superior recall of negative events (Abramson, Metalsky & Alloy, 1989; Bless, Hamilton & Mackie, 1992; Bluck & Li, 2001), and while negative events may dominate many other aspects of cognition (see Baumeister, Bratslavsky, Finkenauer & Vohs, 2001), the overall view is that negative events are poorly retained, and one explanation for this suggests that negative affect actually fades faster than does positive affect.

Diary and experimental studies show a general decrease in emotional intensity over time (Brewer, 1988; Holmes, 1970; Linton, 1975; Matlin & Stang, 1978; Robinson, 1980; Taylor, 1991; Thompson et al., 1996; Wagenaar, 1986; Walker, Vogl & Thompson, 1997; Walker, et al., 2003), but there is good evidence showing this decrease to be greater for negative events. Cason (1932) first recorded this effect for events rated retrospectively at intervals of one and three weeks from the time they were experienced. Ratings of affect decreased across retention intervals, but more sharply for negative events. Holmes (1970) replicated these findings in a diary study designed to rule out possible retrospective biases. Students recorded pleasant and unpleasant events every day, rating each event on an affect scale. A week later they were shown their diary entries (but not the affect ratings) and asked to rate how they currently felt about the events described. As predicted, ratings were lower after a week, with a sharper drop in the ratings of unpleasant



events. Building on those earlier studies Walker, et al. (1997) replicated these effects over retention intervals of 3 months, 1 year, and 4.5 years also using a diary method, so it appears to be a robust phenomenon (see also Walker, Skowronski, Gibbons, Vogl & Thompson;2003). Holmes (1970) speculated that the greater decrease in negative affect over time occurs because the ‘tension’ created by an event is resolved, either because the unpleasantness naturally diminishes in the absence of any dire consequences that were expected to emanate from it, or because it elicits remedial action. A related but more elaborate explanation offered by Walker et al. (1997) recruits Taylor’s (1991) *mobilize- minimize* hypothesis, according to which negative events evoke the rapid mobilization of affect-dampening resources at both the micro (physiological, affective, cognitive) and macro (social) levels of the organism. These responses serve to minimize the long term impact of negative events.

### 1.7.2 *Regret and the fading affect bias*

It will be clear that the temporal pattern of regret presents a challenge to the fading affect bias, since regret is an example of negative events that resist fading. This point is picked up in a recent study by Beike and Krone (2008), who use thought suppression manipulations and measures of recollective experience to show that action regrets resist the fading affect bias more than do inaction regrets over a period of two weeks. Unfortunately, because their study looks at a very short period and employs a sample with an average age of 19 years, it is difficult to extrapolate their findings to longer time periods. Moreover, their methodology assumes that all regrets can be equated with other types of negative event and their use of measures of subjective recollection assumes that all regrets concern discrete episodes.

A simpler explanation for why regret appears to resist the fading affect bias is that not all regrets are comparable to the kind of negative events studied by autobiographical memory researchers. Regret is tied to past events, but those events need not be negative because regret is also experienced for the consequences of events that began positively. Many people who later regret not having made the most of their education may well have rejoiced on the day they left school, and while the *awareness* of misspent time may be negatively experienced, the time itself was not. Similarly, one's wedding day may remain a happy memory long after its unhappy consequences come to be regretted, so while some regrets may indeed involve subjectively recollected discrete negative events (a particularly vivid argument, walking out of an exam), others are more like reasoned evaluations. Participants in regret studies are typically not asked to recall an episode in which they *felt regret*: they are typically asked to recall something they regret, which may amount to the same thing if regret follows very soon after the event, but the temporal pattern of regret suggests that this is not often the case, since many of life's long term regrets appear to concern more general experiences ('Not making the most of education'). Before considering the implications of a distinction between regrets for discrete and extended experiences it is worth considering how such a structural distinction might influence the way negative events are remembered.

### 1.7.3 *Remembering emotional events differently*

The fading affect bias described above and the minimize-mobilize explanation for how it occurs suggest one way in which autobiographical memory deals with unpleasant memories, but another way of rendering unpleasant memories less troublesome is to represent them more abstractly. According to the Conway and

Pleydell-Pearce (2000) model of AM this is precisely what the protective mechanisms within the ‘self memory system’ (SMS) do when emotionally charged memories threaten to disrupt currently active goals. In this model AMs can be accessed by either *direct* or *generative retrieval*: direct retrieval occurs when a memory ‘pops’ into mind in response to some internal or external cue, as in Proust’s (1913/1957) celebrated depiction of how the taste of a petit Madeleine cake dipped in tea instantly transports the adult narrator back to his childhood afternoons spent with his aunt. Generative retrieval by contrast is an effortful top-down search through the autobiographical memory knowledge base, beginning at the general event level and continuing through the autobiographical memory hierarchy until relevant event-specific knowledge has been located. Emotionally arousing memories interfere with this process and so the SMS inhibits the arousal features of the incoming memory by truncating the search at the general event level. Evidence in support of this inhibitory mechanism has been provided in experimental studies (Phillipot, Schaeffer & Herbet, 2003), and the notion of a truncated search at the general event level has recently been recruited to account for the phenomenon of overgeneral memory (see Williams, Barnhofer, Crane, Hermans, Raes, Watkins & Dalgleish, 2007 for a review).

Other lines of evidence also suggest that emotional events are represented more abstractly over time. Levine, (1997) suggests that emotions are fleeting phenomena which cannot be recalled (i.e., re-experienced) and so are always remembered as reconstructions with greater or lesser degrees of phenomenological detail, and Robinson and Clore (2002a,b) have shown that within time frames as short as weeks the recall of emotional information shifts from detailed episodic to more general semantic representations. Negative events in particular are recalled

with less contextual detail (D'Argembeau, Comblain & Van der Linden, 2003; Destun & Kuiper, 1999). Nigro and Neisser (1983) showed that people can also remember events from more or less abstract perspectives: a "field" perspective entails seeing oneself as a participant in the scene, whereas an "observer" perspective means seeing the event as if looking from the outside. Robinson and Swanson (1992) found that events viewed from a field perspective were rated higher on affect than were events viewed from an observer perspective and they suggest that observer perspectives are used to recall the context of emotional events (goals, attitudes), whereas a field perspective accesses 'arousal records'. Adopting an observer perspective can thus serve to inhibit emotional arousal and allow difficult experiences to be remembered. Self-distanced perspectives allow people to process negative events in a reflective manner, focussing on explanations for why the events occurred, whereas adopting a self-immersed perspective and focussing on what actually happened is likely to lead to a more ruminative processing of negative events (Kross, Ayduk & Mischel, 2005). An objective third person perspective might also help people to distance themselves from unflattering aspects of their personal history (Libby & Eibach, 2002).

## **1.8 The temporal pattern of regret re-considered**

The autobiographical memory literature reviewed has highlighted several memory-based factors that have implications for interpretations of regret's temporal pattern. First of all, memories for unpleasant events are forgotten more rapidly than memories for pleasant events and negative events may trigger dampening mechanisms that minimize their long term impact. Protective mechanisms within autobiographical memory may also lead to negative experiences being represented in

more general terms, and people remembering negative experiences or negative views of themselves may adopt detached observer perspectives. These factors, taken together with the observation that events become more general over time, suggest a possibility not considered in current accounts of regret's temporal pattern: that the pattern might be mediated by the mnemonic structure of regret. This possibility is implicit in an observation made by Gilovich and Medvec (1995) that the regret descriptions in their earlier work (Gilovich & Medvec, 1994) differed in their specificity, as rated by independent judges. Action regrets were rated as more likely to involve "decisions made at a specific point in time", and inaction regrets as more likely to result from "an accumulated, unfocused pattern of inaction" (Gilovich & Medvec, 1994, p. 381). The implications of this observation, which appears in a footnote, can be developed to produce some interesting predictions. Gilovich and Medvec (1995) appear to suggest that action regrets are based on specific memories, while inaction regrets are based on general memories.

One possible interpretation of regret's temporal pattern then is that inaction regrets become more salient over time because they are, by definition, more general than action regrets, something reflected in Gilovich and Medvec's (1994) footnote observation. This supposition is consistent with the autobiographical memory literature reviewed and leads to at least two broad predictions. First, the autobiographical memory literature shows that events become more general over time, so if inaction regrets tend to be more general in nature they might be expected to concern more distant events; and if action regrets are indeed like specific negative events, then they would be expected to concern comparatively recent events. Moreover, autobiographical memory research suggests that specific negative events

are more likely to be forgotten over time, which would also imply that overall regrets for specific negative events would be fewer in number.

Regrets have been classified according to their content (Roese & Summerville, 2005), their affective profiles (Kahneman, 1995) and according to whether they concern action or inactions (Gilovich & Medvec, 1995), but as far as can be ascertained, they have yet to be distinguished according to their mnemonic structure. The novel contribution of this thesis is to introduce precisely such a distinction between regrets for specific and general events, and in Chapter 2 it will be argued that viewing regrets in this way makes possible the argument that the temporal profile of inaction regrets is explained by their general representation in memory.

## **Chapter 2: Regret and the reminiscence bump**

### **2.0 Chapter Overview**

The present chapter reports two studies testing the claim that regret's temporal pattern can be accounted for by models of autobiographical memory. This claim is examined in the context of an autobiographical memory phenomenon known as the *reminiscence bump* (Rubin, Wetzler & Nebes, 1986), with particular emphasis on an account of the 'bump' based on life scripts, which makes explicit claims about the temporal pattern of negative events (Berntsen & Rubin, 2002, 2004; Rubin & Berntsen, 2003).

### **2.1 Memory across the lifespan: the reminiscence bump**

Researchers wishing to identify patterns of remembering across the lifespan typically use a word cue method first devised by Galton (1879) and formalised by Crovitz & Schiffman (1974). The technique requires participants to retrieve, describe, and date memories associated with words that are presented to them. Researchers plot these dated events across the lifespan and the resulting frequency histograms represent patterns of remembering as a function of time ago from the present. The reminiscence bump is a feature of such distributions and it describes a disproportionate clustering of memories retrieved from the period of adolescence and early adulthood (typically spanning the years from age 10 to 30). The bump first came to light when Rubin et al. (1986) combined their own data with re-analysed data from three existing word-cue studies (Fitzgerald & Lawrence, 1984; Franklin & Holding, 1977; Zola-Morgan, Cohen & Squire, 1983) and found a reliable increase in memories reported from the period spanning 10 to 30 years of age. The bump was

only observed for adults over the age of 30; for adults under 30 the number of memories recalled decreased linearly as a function of time, as would be predicted by the monotonically decreasing forgetting function first observed by Ebbinghaus (1885/1964). These age related differences led Rubin et al. (1986) to suggest that the systematic deviation from the forgetting function could be explained by a sampling bias based on reminiscence. Reminiscence is the process of reflecting on one's past and it is assumed to begin in midlife. The term has other meanings and associations but Rubin et al. (1986) intend it to mean simply "an increase in memories above what would be expected by a monotonically decreasing retention function" (p. 208).

#### *2.1.1 Replications of the reminiscence bump and some variations*

Hyland and Ackerman (1988) replicated Rubin et al.'s (1986) findings in older adults, but found less reliable distributions for middle-aged adults. The bump was found to be robust in healthy 70 year olds (Rubin & Schulkind, 1997b), in people suffering from Alzheimer's dementia and depression (Fromholt, Larsen & Larsen, 1995) and in patients who had undergone temporal lobectomies as treatment for epilepsy (Buchanan, Tranel & Adolphs, 2006). The bump is observed for memories involving people's most vivid (Fitzgerald, 1988), most important (Rubin & Schulkind, 1997c; Fromholt & Larsen, 1991, 1992) and most significant life events (Elnick, Margrett, Fitzgerald & Labouvie-Vief, 1999) and is strong even when participants report their memories in narrative form (Fitzgerald, 1988). People would include events from the bump period in a book about their lives (Fitzgerald, 1996) and an analysis of 49 eminent psychologists' autobiographies suggests that in fact they do (Mackavey, Malley & Stewart, 1991). According to a cognitive scientist's reading of Proust's (1913/1957) classic of remembering, most of the



remembered episodes in the narrator's life are derived from the period of early adulthood (Delacour, 2001).

These sources of evidence represent a small sample from a large database supporting the robustness of the reminiscence effect, but there have also been some ambiguous findings. Howes and Katz (1992) and Rabbit and Winthorpe (1988) failed to replicate the bump using a manipulation designed to elicit memories from specified periods of the lifespan, while Jansari and Parkin (1996) found that manipulating access to recent events significantly influenced sampling: young adults free to recall events from any period in their lives (Study 1) tended to recall recent events, but when asked not to recall events from the most recent two and a half years, they tended to retrieve memories from between the ages of 5 and 15 years. This was the first evidence of a bump for adults under the age of 40. Blocking recency had no effect on older adults though: they selected remote memories regardless of the manipulation.

The reminiscence bump is a robust phenomenon observed in healthy adults and in clinical populations (Zola-Morgan et al., 1983). In structure if not in content it is similar across cultures (Conway, Wang, Hanyu & Haque, 2005), but perhaps even more remarkable than its universality in the real world is that the reminiscence bump can also be found when dating methodologies are applied to people's dreams (Grenier et al., 2005).

### *2.1.2 Explaining the reminiscence bump*

Several attempts have been made to explain the bump. Jansari and Parkin (1996; Study 2) tested for the possibility that the bump might result from a sampling bias due to a spreading activation effect, whereby an initial bias towards sampling

early memories could lead to people becoming ‘locked in’ to early periods because of highly available associated memories from the same period. To test this hypothesis Jansari and Parkin applied a manipulation designed to prevent such a sampling bias. They divided participants’ lives into two periods (early adulthood and midlife) and had them retrieve two memories from each period, either in forward or reverse temporal order (most distant to most recent period, or most recent to most distant). Response latencies showed that memories from early life were more accessible than memories from midlife, regardless of the order of retrieval. Early memories tended to concern events described as first-time experiences, but did not differ qualitatively from midlife memories on measures of vividness, importance, or pleasantness. Since the restrictive sampling manipulation did not reduce the advantage of earlier memories, Jansari and Parkin concluded that the bump must have some other explanation.

Rubin and Schulkind (1997c) used a similar manipulation to bias retrieval towards childhood memories, but this had no overall effect on the bump. Neither did they find reliable differences between memories from inside and outside the bump on measures of importance, narrative significance, novelty, distinctiveness, emotionality and vividness. The authors concluded that bump memories are neither qualitatively different from memories from other parts of the lifespan, nor are they a product of experimental instructions: they are simply more plentiful.

Rubin, Rahal and Poon (1998) consider three mutually compatible interpretations. The first two accounts are broadly cognitive and are based on the idea that adulthood is a period of rapid change and therefore a time when novel experiences are most frequently encountered. Processing, comprehending, and integrating these novel experiences into existing knowledge structures incurs greater

cognitive investment and therefore makes them more memorable. Coupled to this is the fact that the bump period is a time of rapid cognitive growth, which gives way to cognitive decline with ageing. These factors are assumed to contribute to the relative salience of events from this period.

A second account draws on theories of identity formation (Erikson, 1950) and theories of *social contact* (Carstensen, 1992, 1995) which recognise this period as one of self-development and information seeking. Early adulthood is assumed to be more memorable because there is so much going on in young adult lives, so events from these years become embedded in both internal and external networks and knowledge schemas.

Rubin et al.'s (1998) third account is more speculative and draws together the previous two accounts to suggest that the combined effect of enhanced cognitive function and personal and social identity consolidation would be to contribute to greater genetic fitness. Since the bump years represent the peak of adulthood in terms of fecundity, mate selection, and social cohesion, and since our ancestors probably lived shorter lives than is common now, there might have been greater selection pressure on enhanced cognitive function for this period, where memory would have had greater utility than in later years.

However, the most persuasive interpretations of the bump are those that centre on narrative and identity processes. People evidently view the bump years as formative and important, as a period that represents their 'era' (Sehulster, 1996) and which contains many 'first time' experiences (Jansari & Parkin, 1996) and vivid memories that shape the self-narrative (Fitzgerald, 1988). Early adulthood is a period when experiences in the domains of family, relationships, education and work are seen as central and formative (Elnick et al., 1999) and Conway and Pleydell-Pearce

(2000) attribute the importance of the bump period to its being a time when people are most actively engaged in constructing a cohesive self-schema, establishing social networks and formulating their goals in life. That this period is then followed by relative stability further enhances its salience and importance when viewed in retrospect.

## **2.2 The life script account**

The life script account of the bump (Berntsen & Rubin, 2002, 2004; Rubin & Berntsen, 2003) may be viewed as an elaboration of the narrative and self accounts, but with an emphasis on typical rather than actual lives. This account extends and revises Rubin et al.'s (1998) proposal and is of particular relevance to the present work because it makes explicit claims about the distribution of negative events. In essence, this account proposes that the preferential recall of events from the period of early adulthood arises because retrieval processes are guided by life scripts, which are culturally determined timetables for key transitional events such as finishing education, establishing career paths, starting a family and so on. In an examination of the literature Rubin and Berntsen (2003) found that seven of eleven scripted life events were judged to be located in the bump period. These socially important, often celebrated, and frequently talked about events are generally perceived as *positive* and they provide temporal markers to cue memory retrieval. Conversely, the script account argues that negative events, which are idiosyncratic, unlikely to have scripted time slots, and are less talked about due to social censure, do not enjoy the same selective retrieval. For these reasons life scripts are assumed to predict a bump for positive but not negative events.

In support of this claim Berntsen and Rubin (2002) used survey data from over 1200 respondents asked to date their happiest, saddest, most traumatic and most important memories. Clear bumps were found for happy and important memories, whereas bumps were either absent or less pronounced for sad and traumatic memories. In a subsequent survey Rubin and Berntsen (2003, Study 1) had respondents provide dates for positive (most proud and most in love) as well as negative (most afraid, most angry) events, as well as their most important events, which they then designated as being either positive or negative. The Berntsen and Rubin (2002) findings of a bump for positive but not for negative events were replicated. Rubin and Berntsen (2003, Study 2) then tested their script claim directly by having undergraduates provide estimates of when in the life of a typical 70 year old he/she would most likely experience the emotionally charged events described in the previous studies. The authors hypothesised that a match between the distribution of real and imagined events would indicate the presence of a culturally shared script for the chronology of such events, and such a script could be assumed to be guiding the retrieval of remembered events. The results of the study supported this hypothesis and were subsequently replicated (Berntsen & Rubin, 2004). The life script account has been supported and extended by other researchers and it appears to be gaining acceptance as a plausible explanation for the reminiscence bump phenomenon (Collins, Pillemer, Ivecic & Gooze, 2007; Gluck & Bluck, 2007; Thomsen & Berntsen, 2008).

With regard to regret, the claim that negative events do not show a bump is paradoxical given that the meta-analysis by Roese and Summerville (2005) finds that experiences concerning education, career, romance, parenting, the self, and leisure are most frequently regretted. These are experiences associated with early

adulthood, which is a time of important choices in these domains. Since regret is a negative emotion associated with negative memories, an analysis of regret distributions across time should reasonably be expected to show a bump. However, the point was made in the previous chapter that not all regrets concern discrete negative events: many concern temporally extended or summarised events, or once positive events that have had unhappy endings. Whereas a specific regrettable argument is, in principle, precisely dateable, a general regret for arguing too much stems from many episodes extended over time. For dating purposes then it becomes necessary to distinguish *specific* regrets, which can be traced to a unique point in time, from *general* regrets, which cannot. It is reasonable to speculate that these two types of regret may have different temporal profiles, and this is the argument that will be advanced in the studies to follow.

### *Predictions*

Four testable predictions emerge when regrets are treated as types of autobiographical memories. First, as has been noted, word cue investigations of the reminiscence bump invariably involve the retrieval of specific events, so the failure of life script studies (Berntsen & Rubin, 2002, 2004; Rubin & Berntsen, 2003) to find a bump for negative events should be replicated for specific regrets.

For several reasons it is valid to assume that general regrets will not be randomly distributed over time. First, general regrets often include summarised or repeated experiences, such as not spending time with loved ones. As described in the previous chapter, summarisation requires the passage of time and so the regrettable patterns of behaviour that produce such regrets may only become apparent after much time has elapsed. Second, it is likely that many general regrets

may involve positive events which have gone wrong. These positive events are often scripted to occur relatively early in life, and scripts may facilitate the retrieval of regretted incidents or outcomes. Finally, because summarisation requires the passing of time, and because the consequences of events may only become clear years after the events themselves, a degree of reasoning or self-explanation may be required to determine which aspects of life one regrets. Such regrets are likely to involve the kind of *elaborative counterfactuals* described by Kahneman (1995), which are general in nature and can be expected to rely heavily on schematic, script-like information. Furthermore, people recall extended periods by moving sequentially from the most distant to the most recent events (Barsalou, 1988) and forward temporal ordering facilitates searches within the autobiographical memory knowledge base (Anderson & Conway, 1993). Thus, people seeking causal explanations for life's regrettable consequences might be expected to focus on the formative experiences of early adulthood, which has been shown to be an important period for long-term goal formulation and self consolidation (Conway & Pleydell-Pearce, 2000). For all of these reasons, a second prediction is that a reminiscence bump will be observed for general regrets.

Because events become more general over time, a third prediction is that people will report more general than specific regrets concerning events from the distant past. On the other hand, because specific memories for sad (Berntsen & Rubin, 2002) and important negative events (Rubin & Berntsen, 2003) show evidence of a recency curve, it is expected that people will report more specific than general recent regrets. Finally, building on the assumption laid out in the previous chapter that one structural dimension underlies the distinction between action-inaction and specific and general regrets, a significant overlap between the two is

predicted. There are two parts to the fourth prediction. First, because more recent than distant specific regrets are expected and because regrets for action tend to be relatively short-lived (Gilovich & Medvec, 1995), it is predicted that specific regrets are likely to concern actions. In addition, because more distant than recent general regrets are expected, and because regrets for inaction tend to be persistent (Gilovich & Medvec, 1995), it is predicted that general regrets will predominantly concern inaction.

In Study 1, these predictions were tested using a cued recall procedure in which 75 senior adults were asked to describe and date up to five regrets for either specific or general experiences, which were then examined for content, coded along the action-inaction dimension, and plotted across the lifespan. Study 2 uses a free recall procedure and the addition of a sample of people in their 40s, making it possible to generalise these findings to a younger sample.

The use of cued recall in Study 1 was an attempt to overcome problems encountered by Davison (2005), who asked respondents to freely recall regrets for experiences which they themselves had to designate as specific or general in nature. That study produced many completion errors (involving only specific regrets) whereby respondents either answered both a specific and general question for a single regret, or designated regrets as specific when the descriptions made explicit reference to summarised and multiple experiences, or described lifetime periods. Consequently, Davison (2005) had all of the specific regrets independently recategorised, resulting in a total of 58 regrets being reclassified as general. In the present study it was hoped that restricting respondents' choice would remove this source of error.



## **2.3 Study 1: specific and general regrets across the lifespan of people in their sixties**

### *2.3.1 Method*

#### *Participants*

An opportunity sample of residents from the counties of Durham, Cleveland and Tyne and Wear, and from diverse demographic backgrounds participated. Eighty six out of approximately 400 questionnaires were returned completed, 9 of which were excluded because the respondents were in their 70s and the questionnaire design did not accommodate this age group. This left a sample of 75 participants (36 in the specific group and 39 in the general group), with 45 females and 27 males ranging in age from 60 to 69 years ( $M = 65$  years,  $SD = 2.9$  years). Three participants did not indicate their gender. The educational level of the sample was high. Twenty five respondents had completed secondary school, 15 had gone on to advanced secondary level, 21 were university graduates or had reached a vocational equivalent, while 7 had progressed to various levels of postgraduate study. Five respondents did not supply this information, and 2 reported having had no education. Respondents received questionnaires by post, through contacts who had access to diverse social networks (including groups for the elderly, church groups, political clubs, small businesses etc), via students to their family members, or in person from the first author. Responses were by post.

### *Design, Materials and Procedure*

The study employed a between subjects design in which participants provided details concerning their autobiographical regrets for either specific or general experiences. All materials used in this study, including questionnaires and instructions to coders are presented in Appendix A.

Respondents received a questionnaire contained in a stamped, self-addressed envelope. On the cover sheet of the questionnaire respondents were informed that the purpose of the study was to examine the content and chronology of life regrets. Regret was defined as concerning experiences that people wished had turned out differently, whether they were things they had done or failed to do, bad decisions, unfulfilled ambitions or something else. Respondents were assured that their age, sex, and level of education were the only personal identity details required. Consent was indicated by ticking a box.

There were two versions of the questionnaire; one designed to elicit specific regrets and the other to elicit general regrets. Each version contained a separate sheet with spaces for regret descriptions. Respondents were instructed to look back on their lives so far and the things they regretted and then to use the spaces provided to describe, in no more than one sentence, each regretted experience. A maximum of five regrets was stipulated, but it was made clear that fewer than five was acceptable. Respondents who received the specific questionnaire were told that each regrettable experience should concern something which involved them personally and happened on a particular day in a particular place. They were told that it didn't matter whether the feeling of regret followed immediately or later, but that it was important that they could say when the regretted experience happened. Respondents in the general regret group were told that their regrets should concern experiences which were

general in nature, meaning experiences that did not happen on a particular day in a particular place, but for which they could provide an estimate of the decade of life to which the experience belonged. For both types of regret the rest of the questionnaire comprised separate question sheets for each individual regret. For specific regrets respondents dated the regrets by giving their age at the time of the regretted experience. Because general regrets have diffuse temporal origins, respondents in this group first indicated when they had become conscious of feeling regret and then estimated the decade to which the source experience belonged.

### 2.3.2 *Results*

In this and all subsequent studies in this thesis, planned contrasts are used where directional differences are predicted; otherwise Tukey HSD and Bonferroni post-hoc correction are used where appropriate. In all ANOVAs, the Greenhouse-Geisser correction is reported where sphericity assumptions are violated. Pearson's product moment correlation coefficient ( $r$ ) is used as a measure of effect size, as recommended by Field (2005). The formula for calculating  $r$  is presented in Appendix C. The effect size for all ANOVAs is partial eta squared ( $\eta_p^2$ ). In tables reported in the body of the text, lower case 'n' denotes the number of observations (regrets) and upper case N denotes the sample size for the analysis. Tables of summary and descriptive statistics not included in the body of the text, as well as unreported ANOVAs, are presented in the Appendix B.

### *Data coding*

It became apparent from participants' responses that many regrets were wrongly categorised, despite the cueing constraint. Whereas Davison (2005) found

that only specific regrets were wrongly categorised, the errors in the present study concerned specific regrets describing general experiences (“*Not learning to play the violin*”; “*Didn’t work hard for a year after qualifying*”) as well as general regrets referring to specific episodic events (“*Taking a decision that started a chain of events*”; “*An incident in an English literature class at school*”). Two independent, hypothesis-blind judges recategorised the entire pool of items. They were instructed to code as specific any description which could reasonably be said to concern an event or decision that occurred in the space of a single day, and to code as general any event that was non-specific according to the previous definition. The judges were instructed not to second guess respondents’ thoughts but to establish what could be plausibly inferred from the information provided. Inter-rater reliability was good ( $\kappa = 0.71$ ) and differences were resolved by a third independent judge. In total, 56 specific and 19 general regrets were recategorised. For the purpose of comparison, both the original and recategorised data were analysed and are presented in that order. In both analyses regret type is a between-subjects variable and decade and agency are within-subjects variables.

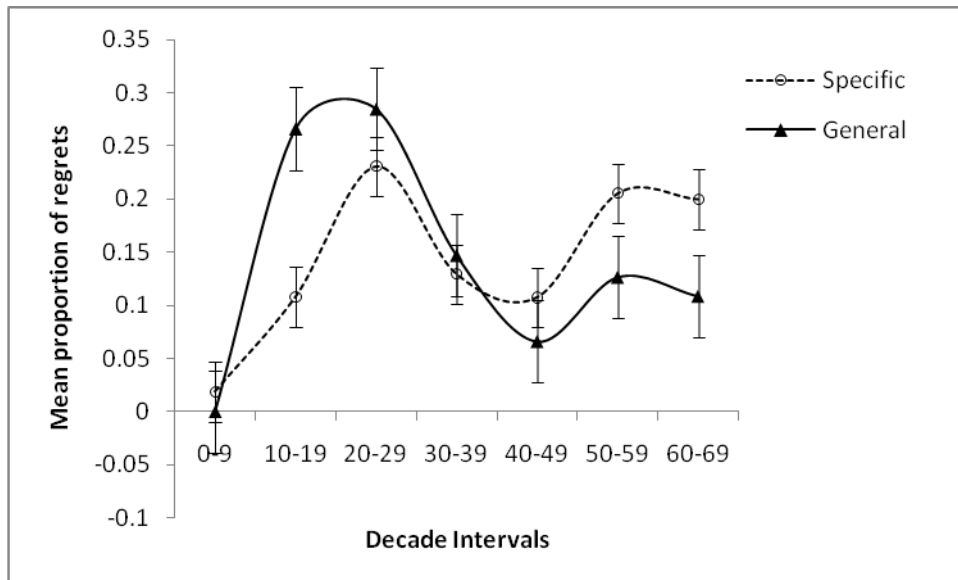
#### *Analysis of the original responses.*

The study produced 240 regrets, 108 of which were specific and 132 general. Because many respondents had only lived through half of the seventh decade, an adjustment (see Appendix C) adapted from Berntsen and Rubin (2002) was calculated to give an estimate of how many regrets respondents would have produced had they all completed the questionnaire on the eve of their seventieth birthday. When applied to the original (miscategorised) regrets the adjustment resulted in a total of 115 specific and 138 general regrets. Tables of descriptive

statistics for both the original and recategorised regrets can be found in Appendix B. The distributions are graphically represented in Figures 2.1 and 2.2. A preliminary analysis of the original dataset showed that men ( $M = 3.64$ ,  $SD = 1.29$ ) produced marginally more regrets on average than did women ( $M = 3.15$ ,  $SD = 1.06$ );  $F(1, 59) = 3.74$ ,  $MSE = 1.32$ ,  $p = .06$ , but level of education did not contribute significantly to the number of regrets produced;  $F(4, 59) = .78$ ,  $MSE = 1.32$ ,  $p > .05$ , and there was no interaction between sex and level of education,  $F(3, 59) = .174$ ,  $MSE = 1.32$ ,  $p > .05$ .

Figure 2.1 shows that for the original data there is a clear bump for general regrets which peaks in decade 3, decreasing sharply over decades 4 and 5, before rising slightly in decade 6 and finally tailing away in the 7<sup>th</sup> decade. The distribution of specific regrets by contrast is bi-modal, with the peak in decade 3 matched by that in decade 6. The bump decades (2 and 3) contain 54% of all general regrets, whereas the same decades account for only 35% of specific regrets, which is only marginally more than the proportion of regrets in the 6<sup>th</sup> and 7<sup>th</sup> decades for that group.

Within each group the proportion of each participant's total number of regrets that were in each decade was calculated. These proportions were then entered into single-sample *t* tests to compare both group distributions against chance. Because of the small number of regrets in the first decade, it was excluded from this and subsequent analyses, though this decade remained in the pool of items used to calculate proportions.



**Figure 2.1 Study 1: original responses. Proportion of regrets as a function of time in decade intervals for specific and general regrets. Error bars represent the standard error of the mean.**

With chance set at .0166 (1/6) only decades 3 ( $M = .23$ ,  $SD = .24$ ), 6 ( $M = .19$ ,  $SD = .24$ ), and 7 ( $M = .21$ ,  $SD = .20$ ) within specific regrets had means above this value, but none of these were significant (see Appendix B). Within general regrets the only decades containing proportions greater than would be expected by chance were decades 2 ( $M = .27$ ,  $SD = .23$ );  $t(38) = 2.76$ ,  $p < .01$ ,  $r = .41$ , and 3 ( $M = .27$ ,  $SD = .27$ );  $t(38) = 2.72$ ,  $p < .02$ ,  $r = .40$ . The only other decades that differed significantly from chance, were 5 and 7, both of which contained significantly lower than chance proportions (see Appendix B). Within general regrets a comparison was made between the individual bump decades and the adjacent decade 4 ( $M = .15$ ,  $SD = .19$ ). Although higher proportions were found in decades 2,  $t(38) = 2.24$ ,  $p > .05$ ,  $r = .34$ , and decade 3,  $t(38) = 2.14$ ,  $p > .05$ ,  $r = .33$ , these did not reach significance following Tukey HSD correction. However, combining the bump decade proportions and comparing them with the combined proportions of decades 4 and 5

showed that the bump decades ( $M = .54$ ,  $SD = .29$ ) had significantly higher proportions than the adjacent two decades ( $M = .22$ ,  $SD = .22$ );  $t(38) = 4.5$ ,  $p < .001$ ,  $r = .59$ .

Planned contrasts were carried out to compare the relative proportions of specific and general regrets within the bump decades. In decade 2 there were significantly higher proportions of general ( $M = .27$ ,  $SD = .23$ ) than specific ( $M = .11$ ,  $SD = .16$ ) regrets,  $t(73) = 3.50$ ,  $p < .005$ ,  $r = .38$ , but although the proportion of general regrets in decade 3 ( $M = .27$ ,  $SD = .27$ ) was greater than the proportion of specific regrets in that decade ( $M = .23$ ,  $SD = .24$ ), the difference did not reach significance;  $t(73) = .92$ ,  $p > .05$ ,  $r = .10$ . Within decade 7 the proportion of specific ( $M = .19$ ,  $SD = .24$ ) regrets was significantly higher than the proportion of general regrets ( $M = .11$ ,  $SD = .12$ );  $t(73) = 2.03$ ,  $p = .05$ ,  $r = .27$ .

#### *Analysis of the overlap between regret type and agency*

The fourth prediction in this study was that because the memory-based distinction is assumed to underlie the distinction between action and inaction regrets there should be a significant overlap between the two. To test this prediction two hypothesis-blind judges, (neither of whom had been involved in the earlier specific/general recategorisation), coded regrets according to whether they were attributed to action, "*Leaving a teaching post*" (32%); inaction, "*Not expressing love and gratitude to parents*" (40%); both action and inaction, "*Joining the navy instead of going to university*" (6%); or neither action nor inaction, "*Being betrayed by a friend*" (22%). The judges reached initial agreement on 74% of their designations ( $\kappa = 0.62$ ) and differences were resolved through discussion between the raters. Proportions were calculated for the number of each participant's regrets (all those

coded as action, inaction, both or neither) that fell into each of the four categories: specific action, ; general action; specific inaction; and general inaction.

The proportions of specific and general action and inaction regrets were entered into a 2 (type: specific/general) by 2 (agency: action/inaction) mixed model ANOVA. Regret type was a between subjects factor and agency was a within subjects factor. The analysis produced no main effects of regret type,  $F(1, 74) = .011$ ,  $p > .05$ , or agency,  $F(1, 74) = 1.40$ ,  $p > .05$ , but there was a significant two way interaction between regret type and agency,  $F(1, 74) = 4.60$ ,  $MSE = .07$ ,  $p < .05$ ,  $\eta_p^2 = .06$ . Planned comparisons of the means involved in this interaction showed some overlap between the two dimensions. General regrets were significantly more likely to be due to inaction ( $M = .45$ ,  $SD = .29$ ) than to action ( $M = .24$ ,  $SD = .30$ );  $t(38) = 2.28$ ,  $p < .05$ ,  $r = .35$ , and although specific regrets were more likely to be due to action ( $M = .39$ ,  $SD = .29$ ) than inaction ( $M = .35$ ,  $SD = .32$ ) the difference did not reach significance;  $t(35) = .69$ ,  $p > .05$ ,  $r = .11$ .

#### *Analysis of regret content*

A system of content coding derived from respondents' descriptions produced eight life domains, four of which (education, work, relationships and self-actualisation) were further divided to produce 15 sub-categories. There was good inter-rater reliability ( $\kappa = 0.78$ ) with coders initially reaching agreement on 80% of domains. Differences were resolved after discussion with, and moderation by, the researcher. Using regrets as the units of analysis the main domains were ranked in descending order as follows: *Family*, "Not getting to know my parents properly" (27%); *Work*, "Joining a consultancy" (13%); *Intimate relationships* "Marrying the wrong person for the wrong reason" (12%); *Education*, "Leaving school too early,



without taking A levels” (11%); *Self-Development*, “Not learning a second language” (9%); and *Character*, “Not being more outgoing” (6%).

Unsurprisingly, the majority of education regrets (93%) fell in the 2<sup>nd</sup> and 3<sup>rd</sup> decades, as did 50% of intimate relationship regrets, and 49% of work regrets. The majority of self-development (76%) and character (57%) regrets also tended to cluster in the bump and approximately a quarter of family regrets were in the bump.

#### *Summary of the results for the original responses*

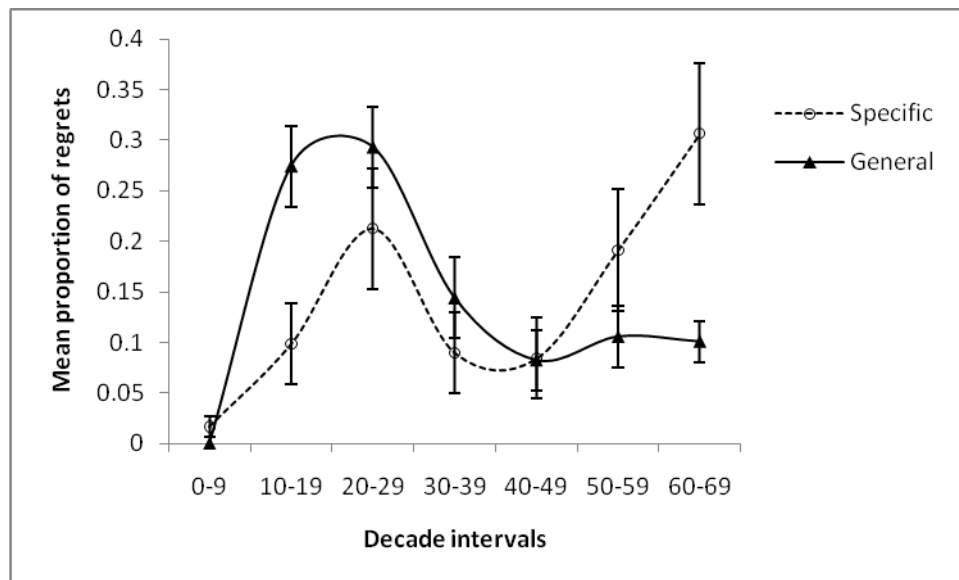
As predicted, distant regrets were more likely to be general, while recent regrets were more likely to be specific than general. A bump was found for general regrets in decades 2 and 3 which is greater than would be expected by chance, whereas the same bump for specific regrets was not greater than would be expected by chance. Moreover the specific regret distribution is bi-modal and has higher proportions of regrets in decades 6 and 7 combined (40%) than in decades 2 and 3 combined (34%). Partial support was found for the fourth prediction of a significant overlap between the two distinctions: general regrets were significantly more likely to be due to inaction, while specific regrets were equally as likely to be due to action as inaction. The results of the content analysis are also consistent with findings in the wider literature, as the most frequently reported regrets concerned the life domains of family, intimate relationships, education, work and self-actualisation.

Taken at face value the regrets produced by this sample support the hypotheses advanced, despite the many categorisation errors.

### *Recategorised responses analysis*

After recategorisation only 11 participants in the specific group were judged to have produced only specific regrets (22 regrets) and only 23 participants in the general group were judged to have produced only general regrets (70 regrets). An analysis using only these participants was deemed unsuitable. It was decided therefore that the analysis should include all participants who had produced at least one regret consistent with their group (i.e., at least one specific regret from someone who filled out a specific regret questionnaire), but that only group-consistent regrets would be included in the analysis (i.e., only the specific regrets from the specific group etc). This resulted in the inclusion of 30 participants in the specific group, who produced 52 specific regrets, and 38 participants in the general group who produced 113 general regrets. The totals after the partial decade 7 adjustment are 57 specific and 117 general regrets. Seven participants (6 specific, 1 general) were excluded because they had failed to produce any regrets consistent with their group.

The within-group decade proportions and decade 7 adjustment were calculated exactly as for the original responses. The distributions of both specific and general regrets are shown in Figure 2.2, and as can be seen the recategorisation has not radically altered the overall shape of the distributions. The main difference is that the specific regret distribution has a more pronounced recency component, which occurs because of the smaller group size resulting from recategorisation, which means the denominator used in the adjustment of decade 7 is smaller.



**Figure 2.2 Study 1: recategorised responses. Proportion of regrets as a function of time in decade intervals for specific and general regrets. Error bars represent the standard error of the mean.**

As with the analysis of the original regrets the proportions in each decade for each group were compared with chance by means of single sample t tests, with chance set at .0166 (1/6). Within specific regrets only decades 3 ( $M = .21$ ,  $SD = .31$ ), 6 ( $M = .19$ ,  $SD = .32$ ), and 7 ( $M = .31$ ,  $SD = .37$ ) had mean proportions above chance, but none of these were significant (Appendix B). Within general regrets the only decades with above chance proportions were decades 2 ( $M = .30$ ,  $SD = .23$ );  $t(37) = 2.85$ ,  $p < .01$ ,  $r = .42$ , and 3 ( $M = .28$ ,  $SD = .27$ );  $t(37) = 2.82$ ,  $p < .01$ ,  $r = .42$ . None of the other decades within general regrets differed significantly from chance (see Appendix B). Within general regrets, post hoc comparisons between the bump decades and the adjacent decade 4 showed that both decades 2 [ $t(37) = 2.12$ ,  $p < .04$ ,  $r = .33$ ] and 3 [ $t(37) = 2.12$ ,  $p < .04$ ,  $r = .33$ ] contained significantly higher proportions of regrets than decade 4 ( $M = .14$ ,  $SD = .23$ ). Between group comparisons within the bump decades showed that in decade 2 there were

significantly higher proportions of general ( $M = .27$ ,  $SD = .23$ ) than specific ( $M = .10$ ,  $SD = .22$ ) regrets;  $t(66) = 3.13$ ,  $p < .01$ ,  $r = .36$ . Although decade 3 contained higher proportions of general than specific regrets, the difference did not reach significance;  $t(66) = 1.12$ ,  $p < .27$ ,  $r = .14$ . Within decade 7, after correcting for unequal variances, the proportion of specific regrets ( $M = .31$ ,  $SD = .36$ ) was significantly higher than the proportion of general regrets ( $M = .09$ ,  $SD = .13$ );  $t(35) = 2.94$ ,  $p < .01$ ,  $r = .44$ .

#### *Analysis of the overlap between regret type and agency*

As with the previous analysis, proportions were calculated for specific actions (*“Assaulting two policemen”*), specific inactions (*“Not going to a police open day and applying to join the force”*), general actions (*“Getting involved with a married woman”*), and general inactions (*“Not going to commercial college after leaving school”*). These proportions were entered into a 2 (type: specific/general) by 2 (agency: action/inaction) ANOVA. Regret type was a between subjects factor and agency was a within subjects factor.

The analysis produced no main effects of regret type,  $F(1, 66) = .21$ ,  $p > .05$  and no main effect of agency,  $F(1, 66) = .04$ ,  $p > .05$ , but there was a significant type by agency interaction,  $F(1, 66) = 10.21$ ,  $MSE = .17$ ,  $p < .005$ ,  $\eta_p^2 = .13$ . Planned comparisons of the means involved in this interaction showed that general regrets were significantly more likely to be due to inaction ( $M = .49$ ,  $SD = .29$ ) than action ( $M = .22$ ,  $SD = .26$ );  $t(37) = 2.71$ ,  $p < .05$ ,  $r = .40$ , and specific regrets were marginally more likely to be due to action ( $M = .46$ ,  $SD = .29$ ) than inaction ( $M = .26$ ,  $SD = .32$ );  $t(29) = 1.91$ ,  $p = .07$ ,  $r = .33$ .

### *Analysis of emergence*

Because respondents in the general regret group estimated both the decade to which the source experience belonged and when they began to experience regret, it was possible to estimate the time elapsed between the regretted event and the manifestation of its affective consequence. For general regrets the median decade for the source experience was the 3<sup>rd</sup> and the median decade in which respondents became conscious of the regret was the 4<sup>th</sup> (mode = 6), so for general regrets there was on average up to a decade between the experience and awareness of its regrettable consequences. A comparable analysis for specific regrets was not possible, as most had only one temporal index.

### *2.3.3 Discussion of Study 1*

Overall, the analyses of both the original and recategorised responses did not produce dramatically different results, and although recategorisation reduced the number of regrets overall, it did not change their relative distributions. Neither did recategorisation produce significantly more inaction than action regrets and the overlap between the two distinctions was more or less the same in both analyses.

Taken as a whole, the results are supportive of the first two predictions of the study in that a reminiscence bump was observed for general but not for specific regrets. The third prediction, that there would be more general regrets from the early part of people's lives and more specific recent regrets, was partially confirmed by the planned comparisons showing significantly higher proportions of general than specific regrets in decade 2. As expected the reverse pattern was found in decade 7

for both the original and recategorised responses, in that this decade contained significantly more specific than general regrets.

Analysis along the action-inaction dimension failed to support previous research in that there was not an overall inaction effect, and the fourth prediction of an overlap between the action/inaction and general/specific distinctions was partially confirmed by the observation that participants' general regrets were significantly more likely to be due to inaction than action. Overall, their specific regrets were not more likely to be due to action than inaction, and although the overlap between specific and action regrets was not as strong as expected, this may be due to the manner in which different types of regret were defined, and may explain why it was deemed necessary to recode some of the regrets produced in this study. In Study 2 clearer definitions of general and specific regrets were provided.

In terms of regret content these findings are broadly consistent with previous research (Roesse & Summerville, 2005) in showing that the domains of family, education, intimate relationships, work and self-actualisation are the most frequently regretted. Also, the finding that the time elapsed between the source event and the awareness of general regrets was at least a decade is consistent with the view (Gilovich, Medvec & Kahneman, 1998) that it is the consequences of their decisions emerging over time that cause people to feel regret.

## **2.4 Study 2: replication and extension of Study 1**

In Study 2 an attempt was made to replicate the results of Study 1 using another group of participants in their 60s. Also included was a group in their 40s to test whether the bump for regret might be observed in younger adults, as has been described for autobiographical memories in adults from the age of 35 on (Jansari &

Parkin, 1996). In this study concerns about participants' self-categorisation of their regrets were addressed by providing clearer definitions of specific and general regrets.

#### *2.4.1 Method*

##### *Participants*

An opportunity sample of 71 residents of County Durham and Stockton upon Tees was recruited by postal survey using procedures similar to those used in Study 1 and involving approximately 320 questionnaires. The sample comprised 45 females and 26 males from diverse demographic backgrounds, all of whom were relatively well educated. Two age groups were recruited, one in their 40s ( $n = 41$ ) with a mean age of 44.4yrs ( $SD = 3.4$ ), and one in their 60s ( $n = 30$ ) with a mean age of 64 yrs ( $SD = 2.9$ ). The combined mean age was 53 years ( $SD = 10.2$ ). Educational levels for the two groups (40s, 60s respectively) were as follows: Secondary (6; 6); Advanced Secondary (2; 9); Graduate (17; 5) and Postgraduate (16; 7). Three respondents from the 60s group did not supply this information.

##### *Design, Materials and Procedure*

In this study a within-subjects design was employed, but the procedure was otherwise similar to that used in Study 1 in that participants first described their regrets and then answered questions about them. However, because of the within-subjects design the questionnaire used in Study 2 differed from that used in Study 1 on one fundamental dimension: participants in Study 1 were asked to recall regrets of a specified type (either specific or general), whereas respondents in Study 2 were free to recall either or both types of regret. Participants first recalled and described

their regrets on the regret sheet provided, after which they designated each of their regrets as being either specific or general in nature. This categorisation process was simplified by providing respondents with clear definitions of both types of regret, which reduced categorisation errors and made reassignment unnecessary.

A specific regret was defined as an experience that *“happened on a particular day in a particular place and involved you personally. It doesn’t matter whether you felt regret immediately after the event or because of things that happened later. What matters is that you can say when the regretted experience happened.”* Participants were instructed that general regrets should meet the following description: *“the regretted experience did not happen on a particular day in a particular place. It should be something that involved you personally. Although you could not put an exact date on such an experience, you could say which decade of your life it belonged to.”* For both regret types the method of dating remained the same as in the first study.

The present study also differed from the previous study in that two additional temporal measures were included. To gauge how long participants expected their regrets to last they were asked to estimate how likely they thought it was that their regrets would persist to the end of their lives. Persistence ratings were given on an 11 point scale anchored at 0 (not at all likely) and 10 (absolutely certain). Participants were also asked to estimate how intense their regret was at the time of the regrettable experience, how intense it was at the time of completing the questionnaire, and how intense they expected it to be at the end of their lives. As has already been mentioned, general regrets by their nature differ from specific regrets in that they concern experiences with diffuse temporal and spatial origins and many may also concern experiences that were not deemed regrettable at the time, so for such regrets



it is clearly not appropriate to ask about past regret intensity. However, for many other general regrets (a regrettable holiday with friends for example) it is quite appropriate to ask about past regret intensity. Whilst acknowledging the limitations of this question for general regrets, it is included for the sake of balance and the limitations must be taken into account when interpreting the results. All intensity ratings were given on a 10 point scale anchored at 1 (very mild) to 10 (very intense).

#### *2.4.2 Results*

The principal aims of this study were twofold; first, to replicate the findings of Study 1 by showing a reminiscence bump for general but not specific regrets, and second, to demonstrate the bump phenomenon for different age groups. The analyses of the two groups are presented separately, with the exception that combined analyses are reported for persistence and intensity, and for the overlap between action-inaction and specific-general regrets.

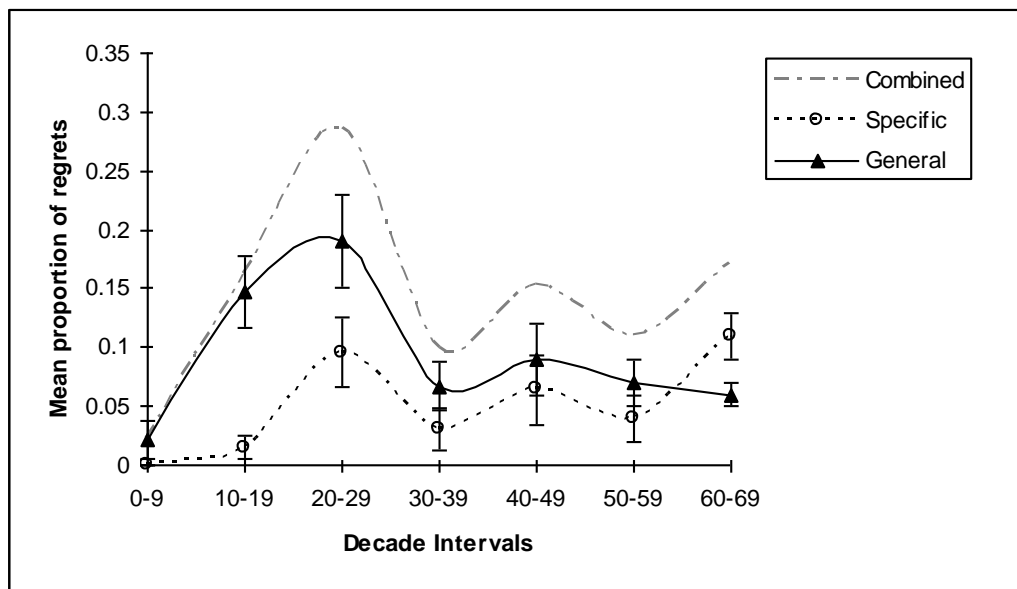
##### *Analysis of the 60s group*

Because the present study uses a within subjects design the procedure used to calculate regret proportions differs somewhat from the procedure used in Study 1 for both the original and recategorised responses. In Study 1 the proportions per decade were calculated using the group total as the denominator, whereas in Study 2 proportions are calculated using the overall total of the sample as the denominator.

The 60s group produced 31 specific and 68 general regrets after the partial-decade adjustment. Preliminary analyses showed that the number of regrets produced was not affected by either sex,  $F(1, 20) = 2.14$ ,  $MSE = 1.52$ ,  $p > .05$  or level of education,  $F(3, 20) = 1.73$ ,  $MSE = 1.52$ ,  $p > .05$ .

A single sample t-test revealed that the mean proportion of general regrets ( $M = .65$ ,  $SD = .32$ ) was significantly above chance,  $t(29) = 2.50$ ,  $p < .05$ ,  $r = .42$ .

As can be seen in Figure 2.3 the bump phenomenon observed in Study 1 has been replicated for a second group of 60 year olds, with the peak of the bump in the third decade for the combined categories.



**Figure 2.3 Group A (60s). Proportion of regrets as a function of time in decade intervals for combined, specific and general regrets. Error bars represent the standard error of the mean.**

A One Way ANOVA produced a significant main effect of decade,  $F(3.61, 104.54) = 2.61$ ,  $MSE = .03$ ,  $p < .05$ ,  $\eta_p^2 = .08$ . Tukey HSD post hoc analysis confirmed that the reminiscence bump peaked in decade 3. Thus, although decade 2 ( $M = .16$ ,  $SD = .19$ ) contained a higher proportion of participants' regrets than decades 4 ( $M = .10$ ,  $SD = .15$ ), 5 ( $M = .15$ ,  $SD = .24$ ) and 6 ( $M = .11$ ,  $SD = .21$ ), none of the differences were significant ( $ps > .05$ ). However, decade 3 ( $M = .29$ ,  $SD = .28$ ) contained a significantly higher proportion of participants' regrets than

decades 4 ( $t = 3.01, p < .05, r = .49$ ) and 6 ( $t = 2.46, p < .05, r = .42$ ). Analyses of the specific and general distributions separately showed a significant main effect of decade for general regrets,  $F(3.42, 99.08) = 2.47, \text{MSE} = .05, p < .05, \eta_p^2 = .08$ , but not for specific regrets,  $F(3.33, 96.49) = 1.912, \text{MSE} = .03, p > .05, \eta_p^2 = .06$ . Tukey HSD post hoc analysis of the significant main effect showed a significant difference between general regret proportions in decades 3 ( $M = .19, SD = .26$ ) and 4 ( $M = .07, SD = .13$ );  $t(29) = 2.41, p < .05, r = .41$ ) and a significant difference between decades 3 and 7 ( $M = .06, SD = .07$ );  $t(29) = 2.58, p < .01, r = .43$ ).

Planned comparisons showed significantly higher proportions of general than specific regrets in decade 2,  $t(29) = 3.41, p < .01, r = .53$  and a marginally significant difference in decade 7, which contained higher proportions of specific than general regrets,  $t(29) = 1.92, p = .06, r = .28$ , showing the same recency effect for specific regrets that was found in Study 1. Surprisingly, given that the peak of the bump appears to fall in the third decade, the proportion of general regrets in this decade was not significantly greater than the proportion of specific regrets,  $t(29) = 1.36, p = .18, r = .33$ . Nonetheless, these findings are consistent with the third prediction that, across time, people report proportionally more general than specific regrets..

### *Analysis of emergence*

For general regrets the analysis of the time elapsed between the source experience and awareness of regret showed that for the source experience the median decade was the 3<sup>rd</sup>, while the median decade for awareness of regret was the 5<sup>th</sup> (the modal decade was the 6<sup>th</sup>), so at least ten years separated the experience from its affective consequences. Again, no comparable analysis was possible for specific regrets.

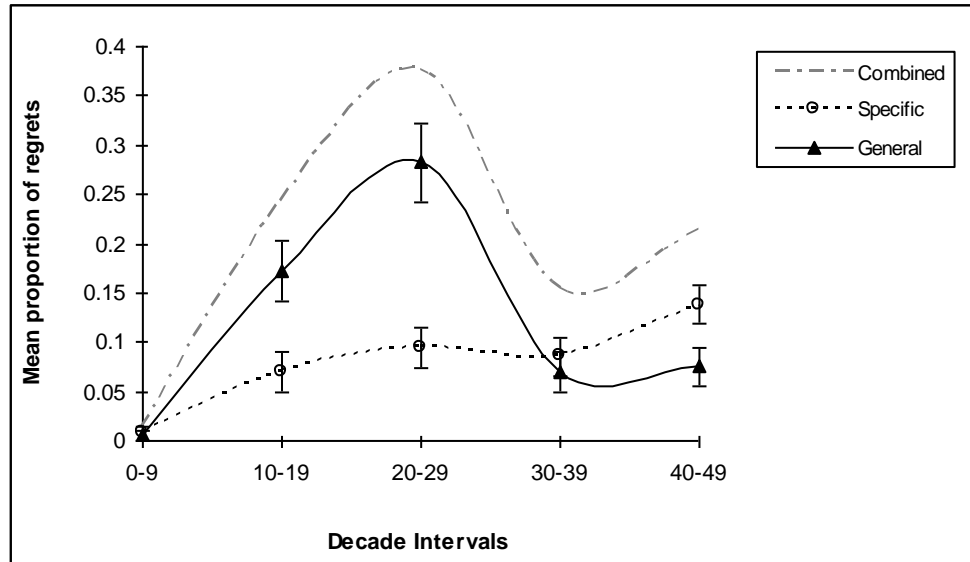
### *Analysis of content*

Using the content domains of Study 1, regrets from both the 60s and 40s groups were coded by the researcher and one blind rater and then separate and combined analyses of content were carried out. Initial agreement of 89% was reached ( $\kappa = 0.76$ ) and this was increased to 96% after discussion. The remaining regrets were excluded. Analysis of content for the 60s group revealed the following domains in rank order: *Family* (24%); *Self-Actualisation* (16%); *Work* (10%); *Education* and *Intimate relationships*, both with 10%; and *Health* (6%). As with the previous study, an analysis of the regrets in the bump decades revealed that all eight education regrets were located in the bump decades, as were 70% of work regrets, a third of regrets concerning intimate relationships and just over a third of family regrets, as well as about 60% of self-actualisation and character regrets.

### *Analysis of the 40s group*

After a partial-decade adjustment was applied to the fifth decade, the 40s group produced 59 specific and 84 general regrets. A preliminary ANOVA showed that this adjusted total of 143 regrets was not significantly affected by sex  $F(1, 34) = .19$ ,  $MSE = 1.55$ ,  $p > .05$  or level of education  $F(3, 34) = .65$ ,  $MSE = 1.52$ ,  $p > .05$ . A proportion was calculated for each participant's regrets that were specific or general and from each of the five decades of their life (see Appendix B for the descriptive statistics). The distribution of these proportions is presented in Figure 2.4. Again, a single sample t-test revealed that the mean proportion of general regrets (.60,  $SD = .29$ ) was significantly above chance,  $t(40) = 2.31$ ,  $p < .05$ ,  $r = .34$ . The proportions per decade (excluding those for decade 1) were entered into a One Way ANOVA. This analysis revealed a main effect of decade,  $F(2.33, 92.81) =$

4.61,  $MSE = .05$ ,  $p < .01$ ,  $\eta_p^2 = .10$ . Tukey HSD post hoc analysis of this main effect showed significantly higher proportions of regrets in decade 3 ( $M = .38$ ,  $SD = .32$ ) than in decades 4 ( $M = .15$ ,  $SD = .21$ );  $t(40) = 3.17$ ,  $p < .005$ ,  $r = .51$ , and 5 ( $M = .21$ ,  $SD = .17$ );  $t(40) = 2.43$ ,  $p < .05$ ,  $r = .36$ .



**Figure 2.4 Group B (40s). Proportion of regrets as a function of time in decade intervals for combined, specific and general regrets. Error bars represent the standard error of the mean.**

Analysis of the distributions separately showed that the overall effect of decade was due to general regrets;  $F(2.02, 80.79) = 8.41$ ,  $MSE = .07$ ,  $p < .001$ ,  $\eta_p^2 = .17$ . No main effect was found for specific regrets,  $F(3, 120) = 1.60$ ,  $MSE = .02$ ,  $p > .05$ ,  $\eta_p^2 = .03$ . Tukey HSD post hoc comparisons on the general distribution showed significantly higher proportions of regrets in decade 3 ( $M = .28$ ,  $SD = .30$ ) than in decades 4 ( $M = .07$ ,  $SD = .14$ );  $t(40) = 3.97$ ,  $p < .001$ ,  $r = .53$ , and 5 ( $M = .08$ ,  $SD = .11$ );  $t(40) = 3.90$ ,  $p < .001$ ,  $r = .52$ .

Planned comparisons of the means showed that general regrets were found in significantly higher proportions than specific regrets in decades 2 ( $M_{\text{general}} = .17$ ,  $SD$

$=.22$  vs  $M_{\text{specific}} = .07$ ,  $SD = .15$ ;  $t(40) = 2.22$ ,  $p < .05$ ,  $r = .33$ ) and 3 ( $M_{\text{general}} = .28$ ,  $SD = .30$ , vs  $M_{\text{specific}} = .09$ ,  $SD = .15$ ;  $t(40) = 3.46$ ,  $p < .005$ ,  $r = .48$ ). In decade 5 specific regrets ( $M = .13$ ,  $SD = .21$ ) were found in significantly higher proportions than general ( $M = .08$ ,  $SD = .11$ ) regrets,  $t(40) = 2.22$ ,  $p < .05$ ,  $r = .33$ .

### *Analysis of content*

Analysis of content for the 40s group revealed the following domains in rank order: *Family* (21%); *Education* (19%); *Intimate relationships* (16%); *Self-actualization* (9%); *Work* and *Character*, both with 8.5%. Again, almost all education regrets (92%) fell in the bump decades, as did 73% of work-related regrets, 63% of intimate relationship regrets, over half (56%) of family regrets and most of the regrets concerning self-actualisation (89%). All eight character regrets reported by this group came from the bump decades.

### *Estimates of persistence and intensity over time*

The persistence and intensity ratings for both groups are provided in Table 2.1. Only 37 participants reported having at least one regret of each type and since the analyses of persistence and intensity are entirely within-participants, only the 132 regrets from these participants are used. Although no between group hypotheses were advanced for this analysis a between groups analysis was carried out nonetheless.

**Table 2.1 Persistence and intensity across time for specific and general regrets, with means and standard deviations.**

	60s (N = 13)				40s (N = 24)			
	Specific		General		Specific		General	
	n = 23		n = 26		n = 41		n = 42	
	M	(SD)	M	(SD)	M	(SD)	M	(SD)
<i>Persistence</i>								
<i>To the end of life</i>	8.54	(2.96)	7.15	(2.70)	6.34	(3.20)	4.55	(3.09)
<i>Intensity</i>								
<i>T1 (At the time)</i>	7.60	(3.02)	5.02	(3.00)	6.89	(3.31)	4.97	(2.38)
<i>T2 (Now)</i>	7.70	(2.94)	5.61	(2.89)	6.26	(2.20)	5.28	(2.56)
<i>T3 (End of life)</i>	6.87	(3.41)	5.19	(3.04)	4.02	(2.77)	3.88	(2.92)

The mean persistence ratings were entered into a 2 (type) by 2 (group) ANOVA, revealing a main effect of regret type such that ratings overall were higher for specific ( $M = 7.11$ ,  $SD = 3.25$ ) than for general ( $M = 5.47$ ,  $SD = 3.18$ ) regrets;  $F(1, 35) = 9.11$ ,  $MSE = 4.67$ ,  $\eta_p^2 = .21$ ,  $p < .01$ . There was a significant main effect of group, such that participants in their 60s ( $M = 7.85$ ,  $SD = 2.50$ ) rated their regrets as significantly more likely to persist than did participants in their 40s ( $M = 5.45$ ,  $SD = 2.70$ );  $F(1, 35) = 7.00$ ,  $MSE = 13.85$ ,  $p > .05$ ,  $\eta_p^2 = .17$ . The two way interaction between regret type and group was non-significant;  $F(1, 35) = .15$ ,  $p > .05$ .

The ratings of intensity were entered into a 2 (type) by 2 (group) by 3 (time: then, now, end of life) ANOVA. There was a main effect of regret type  $F(1, 35) = 12.94$ ,  $MSE = 1.58$ ,  $p > .005$ ,  $\eta_p^2 = .27$  such that intensity ratings were higher overall for specific ( $M = 6.30$ ,  $SD = 2.21$ ) than for general ( $M = 4.91$ ,  $SD = 2.15$ ) regrets. There was a main effect of time;  $F(1.22, 42.70) = 3.82$ ,  $MSE = 13.18$ ,  $p < .05$ ,  $\eta_p^2 =$

.10, but no main effect of group;  $F(1, 35) = 3.46$ ,  $MSE = 17.81$ ,  $p > .05$ ,  $\eta_p^2 = .10$ .

There was a significant interaction between regret type by time  $F(1.59, 55.74) = 3.48$ ,  $MSE = 10.24$ ,  $p < .05$ ,  $\eta_p^2 = .10$ , but no significant interaction between group and type;  $F(1, 35) = 1.58$ ,  $MSE = 9.37$ ,  $p > .05$ ,  $\eta_p^2 = .04$ , between group and time;  $F(1.22, 42.70) = 1.59$ ,  $MSE = 20.95$ ,  $p > .05$ ,  $\eta_p^2 = .04$ , nor between type, group and time;  $F(1.59, 55.74) = .031$ ,  $MSE = 2.94$ ,  $p > .05$ ,  $\eta_p^2 = .01$ .

Tukey HSD post hoc analysis of the main effect of time showed a significant drop in intensity ratings between T2 ( $M = 6.18$ ,  $SD = 2.40$ ) and T3 ( $M = 4.99$ ,  $SD = 2.71$ ), so overall participants expected the intensity of their regrets to decrease with the passage of time;  $t(30) = 5.82$ ,  $p < .01$ ,  $r = .77$ . Separate ANOVAs for specific and general regrets showed that the interaction between regret type and time was driven by specific regrets,  $F(1.2, 44.3) = 7.74$ ,  $MSE = 9.95$ ,  $p < .01$ ,  $\eta_p^2 = .18$ , as the intensity rating for specific regret at T3 were significantly lower than the ratings at T1 ( $t = 2.92$ ,  $p < .05$ ,  $r = .51$ ) and T2 ( $t = 5.64$ ,  $p < .01$ ,  $r = .75$ ). For general regrets there was no significant effect of time,  $F(1.4, 51.4) = 2.42$ ,  $MSE = 6.08$ ,  $p > .05$ ,  $\eta_p^2 = .06$ .

Participants in their sixties rated their regrets as more likely to persist than did participants in their forties. In both age groups the intensity ratings for specific regrets were significantly higher than those for general regrets. There were no other significant differences between the two age groups.

#### *Analysis of the overlap between the two distinctions*

To examine the overlap between the specific-general and action-inaction distinctions the data from both groups were combined, using the regret totals from the first five decades of the 60s group ( $n = 71$ ) and the adjusted totals for the 40s



group (n=143), giving a total of 214 regrets. Using the system of action/inaction coding from Study 1, initial agreement of 96% was reached by two judges ( $\kappa = 0.88$ ) and after resolving differences through discussion and moderation by the researcher this reached 98%. Three “indeterminate” regrets were removed from further analysis. Of the remaining 211 regrets 27% were coded as actions (“*selling a valuable chest of drawers*”), 46% as inactions (“*not going into teaching earlier*”), and 27% coded as neither (“*I regret that I am a widow*”).

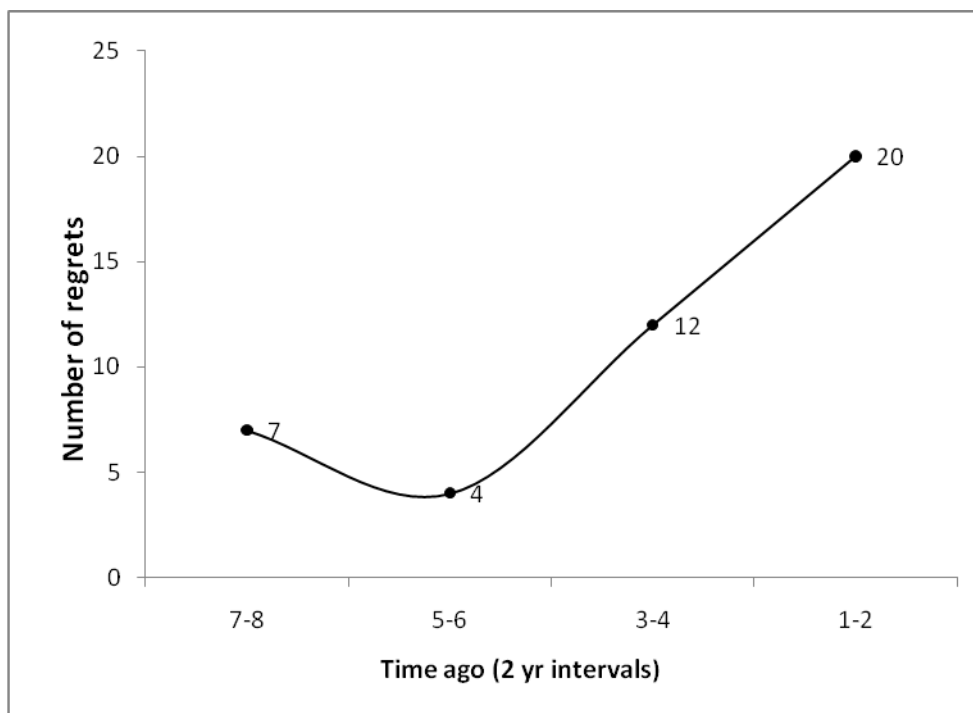
As with the analysis in Study 1 proportions were calculated for each participant’s regrets (those coded as, action, inaction and neither) that were due to specific action (“*Choosing to go out with a new boyfriend*”), specific inaction (“*Not going to have coffee with ex wife*”), general action (“*Smoking*”) and general inaction (“*Not appreciating my soul mate*”). These proportions were entered into a 2 (group) by 2 (type: specific/general) by 2 (agency: action/inaction) mixed model ANOVA. There was a main effect of type,  $F(1, 68) = 8.40$ ,  $MSE = .08$ ,  $p < .006$ ,  $\eta_p^2 = .11$ , so that, on average, participants were more likely to have general ( $M = .45$ ,  $SD = .34$ ) than specific ( $M = .27$ ,  $SD = .30$ ) regrets. The analysis also revealed a main effect of agency,  $F(1, 68) = 35.10$ ,  $MSE = .05$ ,  $p < .001$ ,  $\eta_p^2 = .34$ , such that a higher proportion of the regrets described by each participant were due to inaction ( $M = .50$ ,  $SD = .32$ ) than action ( $M = .23$ ,  $SD = .23$ ). There was also a significant interaction between regret type and agency,  $F(1, 68) = 20.25$ ,  $MSE = .07$ ,  $p < .001$ ,  $\eta_p^2 = .23$ . Planned comparisons of the means involved in this interaction revealed that, as in Study 1, participants’ general regrets were significantly more likely to be due to inaction ( $M = .37$ ,  $SD = .33$ ) than action ( $M = .09$ ,  $SD = .15$ ),  $t(69) = 6.23$ ,  $p < .001$ ,  $r = .60$ . Although on average, participants described more specific regrets that were due to action ( $M = .14$ ,  $SD = .20$ ) than they did specific regrets due to inaction ( $M$

=.13, SD = .26), this difference was not significant. The results of the analysis also contained a significant agency by group interaction,  $F(1, 68) = 21.60, p < .001, \eta_p^2 = .24$ . As no specific predictions had been made about this interaction, Tukey HSD tests were used to compare means. These showed that participants in the 40s group reported a significantly ( $p < .001$ ) higher proportion of action regrets ( $M = .32, SD = .22$ ) than did participants in the 60s group ( $M = .10, SD = .18$ ). The reverse pattern was observed for inaction regrets, with significantly ( $p < .01$ ) higher proportions reported in the 60s group ( $M = .66, SD = .37$ ) than in the 40s group ( $M = .39, SD = .26$ ). Finally, the type by group interaction was non-significant,  $F(1, 68) = 1.60, MSE = .08, p = .2, \eta_p^2 = .02$ . Although participants in the 40s group described more specific regrets ( $M = .30, SD = .24$ ) than did those in the 60s group ( $M = .23, SD = .37$ ), and there was a higher proportion of general regrets in the 60s group ( $M = .50, SD = .40$ ) than in the 40s group ( $M = .41, SD = .28$ ), neither of these differences was statistically significant.

#### *Fine grained recency analysis*

Finally, the distribution of recent specific regrets was examined to see whether or not they followed the patterns found for memories in comparable reminiscence bump studies. Because of the small number of recent regrets in each study the analysis is collapsed across both studies and combines the specific regret totals from the most recent decade in each group (43 regrets). One participant produced two regrets in the most recent decade, but these were excluded from the analysis in order to keep the data independent; so no participant contributed more than one regret to this analysis. For each specific regret the time elapsed between the participant's age and the date given for the regrettable event was calculated. The

temporal distribution of these regrets, broken down into two year time periods may be seen in Figure 2.5. As predicted by previous work (Rubin et al., 1986) there were significant differences in the within-decade distribution,  $\chi^2(3) = 13.65$ ,  $p < .001$ , with the highest number of regrets (46%) in the most recent two years and 74% of the total falling within the most recent half of the decade. These results further strengthen the view of specific regrets as being comparable to negative memories.



**Figure 2.5** Specific regrets located in the most recent decade as a function of time elapsed in 2 –year bins. Results collapse across study and age group.

#### 2.4.3 Discussion of Study 2

The results of Study 2 replicate those of Study 1 by showing a bump overall for participants in their 40s and in their 60s. In both groups the bump is confined to general regrets and there are more general than specific regrets early on, but more

specific than general recent regrets. The overlap between the action/inaction and specific/general distinctions has also been replicated, with strong evidence for the general/inaction overlap but more ambiguous evidence for the overlap between specific/action regrets.

Interestingly, the persistence and intensity analysis showed that for both age groups specific regrets were rated as more likely to endure to the end of life and were rated as more intense overall, though the intensity was expected to decrease towards the end of life. The fact that Studies 1 and 2 produced so few specific regrets overall is evidence that on the whole specific regrets either do not in fact persist over long periods or else they become less accessible. The higher intensity ratings may mean either that these are particularly troublesome specific regrets, or that they feel more intense because specific regrets tend to be more recent.

One point worth noting concerns the problem of miscategorisation found in Study 1 and in Davison (2005). The fact that this problem was effectively removed in Study 2 is itself interesting, as it might seem natural to assume that a type-constrained recall should be more likely than free recall to produce the target type of regret. However, Davison (2005) found only specific regrets to be miscategorised, whereas errors were found for both types of regret in Study 1. There are many possible interpretations of this problem, but there are at least two straightforward practical explanations that might be advanced. The first is that participants simply didn't understand the instructions, which is a reasonable assumption. Participants may understand specific to mean 'particular' and so assume they are being asked to provide a discrete regret that is distinct from other regrets they might have. A second interpretation is that respondents simply feel the need to use their regrets once they have generated them. In memory studies participants draw on an almost

unlimited pool of memories, which may then be discarded and replaced if they don't fit the experimental criteria, whereas even the most disastrous life is unlikely to include an unlimited supply of regrets. Most participants in the studies presented here struggled to find even five, suggesting that they are a relatively precious commodity not to be wasted. It is doubtless even more difficult to think of five specific regrets, (and there were more miscategorisation errors for specific regrets) so in the absence of a choice, respondents may simply supply whatever they have remembered. This may be an attempt to justify their own effort, or it may be that writing their regrets down serves some cathartic function, or perhaps they simply feel a sense of obligation to the researcher.

## **2.5 Chapter discussion**

The results of both studies reconcile the life script account of the reminiscence bump with regret research locating life's most regretted experiences in the period of early adulthood. First of all, adults in their 40s and 60s regretted proportionally more experiences from early adulthood than from other periods of their lives, but this pattern applied only to general and not to specific regrets. That no bump was found for specific regrets is consistent with the life script argument and with research showing less favourable retention of negative events (Walker et al., 1997). Second, the intuition that regret content should predict a bump was confirmed by the distribution of general regrets, the most frequent source of which were experiences concerning education, intimate relationship (including marriage and parenting) self-actualisation and character. These domains were predominantly associated with the bump decades.

More broadly, the results are consistent with models of autobiographical memory and with theories of temporal construal in showing that regrets for distant events tend to concern experiences of a general nature, while recently regretted events tend to be more specific.

Why should a bump be observed for general but not for specific regrets? Rubin and colleagues (Rubin & Berntsen, 2003; Berntsen & Rubin, 2004) attribute the absence of a bump for negative events to the idiosyncratic and chronologically random nature of such events. A specific regret like “Arguing with a family member” is a common but idiosyncratic experience that could occur anywhere in the life course. These characteristics and the distributions observed for specific regrets suggest they are comparable to the specific negative memories studied by Rubin and colleagues.

The bump for general regrets seems less straightforward to interpret. Summarised regrets (“Being too fussy about housework at the expense of time spent with the children.”) are aggregates of repeated experiences and as such require the passage of time to be realised. Regrets indexed by lifetime periods (“Not working hard enough at school”), unlike specific regrets, appear to be neither random nor idiosyncratic, and have instead a script-like cultural and temporal regularity. When generating their regrets participants may have imagined alternative personal histories by manipulating ‘typical’ or schematised life experiences, which are by definition generic. Experiences such as finishing education, starting a family and so on are located in the bump period. As these personally and socially important transitions are loaded with positive expectations, many general regrets may concern scripted events gone wrong.

As mentioned in the introductory chapter an important difference between general regrets and the specific negative memories used in life script studies is that the source event of a general regret need not have been negative, and as Gilovich, Medvec and Kahneman (1998) note, what emerges over time is the awareness that there are consequences to be regretted. This was apparent in both studies: participants reported up to a decade elapsing between the regretted event and the awareness of its consequences.

The emergent quality of general regrets makes them something to be explained, more like retrospective judgements than straightforward recollections. This characterisation reflects views of adult development which see retrospective reasoning in the form of reminiscence and ‘life review’ as naturally occurring processes of both the middle (Erikson, 1950/1997; Levinson, 1978; Stewart & Vanderwater, 1999) and latter stages of the lifespan (Butler, 1963). This view is also consistent with autobiographical memory research showing a greater reliance on judgement processes for events that do not originate directly from perception (Johnson, Foley, Suengas & Raye, 1988). Whereas regret for a consequential exam failure is likely to be anchored to a specific event, the more general regret for a poor academic outcome will require a causal explanation combining memories and inferences based on multiple experiences of poor performance.

Narrative accounts of autobiographical memory support this view of general regrets. Bluck and Habermas (2000) propose that through *autobiographical reasoning* people mentally organise their life narratives and construct *life story schemas* from recollections and semantic knowledge. Continuity and narrative coherence are maintained over time by chronologically ordering events according to normative timetables, while linking events and themes helps people to find causal

explanations for their experiences. Since establishing causality and retrospective sense-making are central to counterfactual thinking and regret, general regrets doubtless involve much autobiographical reasoning.

When people are seeking causal explanations for life's regrettable consequences, they might be expected to focus on the formative experiences of early adulthood. This was reflected in the finding that regrets of family, relationships, education, work, self-actualisation and character figured prominently in the bump period, which is consistent with autobiographical memory studies previously described in which the importance of this period is confirmed. When Conway and Holmes (2004) plotted lifespan memory distributions according to themes associated with the psychosocial stages of Erikson's (1950/1997) model of adult development, they found a preoccupation with issues of identity and intimacy in memories from the bump. Finally, the autobiographically consequential experiences found by Mackavey, et al. (1991) to be associated with early adulthood were predominantly non-episodic, or general in nature.

In summary, no bump was observed for specific regrets because like the negative memories in the life script studies they are idiosyncratic and randomly distributed across the lifespan. At the same time a number of factors may contribute to the bump observed for general regrets: (1) the formation of general memories requires the passage of time; (2) many general regrets concern positive events scripted to occur in the bump period; and (3) many general regrets emerge years after the incidents that caused them, and in the course of attributing cause for those regrets, people may focus on big changes to their lives which, due to the structure of autobiographical memory, may lead to them identifying early scripted events as potential causes.



### *2.5.1 The overlap between the distinctions*

A primary aim of these studies was to examine the relationship between the action/inaction and specific/general distinctions as applied to regret. While there is evidence for alignment between the distinctions, these results suggest that they are not completely interchangeable. The relationship between inaction and general regrets seems strong, but the relationship between specific and action regrets is less clear, as suggested by the observation that although specific regrets were as likely to be due to action as inaction, they are not as reliably associated with action as general regrets are with inaction. In addition, Study 2 showed that agency interacted significantly with group whereas regret type did not. Older participants were significantly more likely than younger participants to regret inaction, but the difference due to age in general regrets was non-significant.

### *2.5.2 The relationship between regrets and the life script*

These studies appear to suggest that the bump found for general regrets might be influenced by generic representations involving normative, script-like events. The domains most representative of the bump period were education, work, intimate relationships and family, self-development, and character, and of these regrets two thirds were general. These domains are reliably found across regret surveys and have been shown here to be implicated in determining regret's temporal profile. This suggests that it should be possible, using life script methodologies (Berntsen & Rubin, 2004; Rubin & Berntsen, 2003; Erdogan et al., 2008) to predict what people are likely to regret in life and when their regrettable experiences are likely to occur. If a normative script influences the way regrets are remembered, then its influence

should be observed in the way regrets are anticipated. Simply put, it should be possible to demonstrate a regret script by asking young people what they expect themselves and others to regret in life and to say when they expect these regret-worthy experiences to occur. Studies addressing these questions are presented in the following chapter.

## **Chapter 3: Regret and the preminiscence bump**

### **3.0 Chapter overview**

In the previous chapter the life script was recruited to explain the reminiscence bump for retrospective (experienced) regret. As the life script can also be applied to future events (Berntsen & Rubin, 2004; Rubin & Berntsen, 2003) the studies in this chapter consider its contribution to the lifespan distribution of prospective (anticipated) regrets provided by young people living through the reminiscence bump period. If the life script is important in determining the reminiscence bump for retrospective general regrets, then a pronounced *preminiscence bump* in early adulthood should also be found for prospective general regrets. This claim is examined in a series of four studies involving the remembered (Study 3) and imagined (Studies 3 – 4c) regrets of young adults.

### **3.1 Thinking about past and future autobiographical experience**

Many of the cognitive and motivational factors that constrain remembering also constrain how the future is imagined (Johnson & Sherman, 1990). Thinking forwards and backwards in time engages similar cognitive processes and may even recruit similar neural substrates (Atance & O'Neill, 2001; Buckner & Carroll, 2007; Cabeza & St Jacques, 2007; Okuda et al., 2003; Schacter & Addis, 2007; Wheeler et al., 1997). D'Argembeau and Van der Linden (2004) found many perceptual and affective attributes were shared by specific past and future events elicited by word-cues. The phenomenology and specificity of both types of event were also mediated by temporal distance, such that temporally near past and future events evoked a stronger sense of being “re(pre)-experienced” and contained more sensorial and

contextual detail than did temporally distant events. In both temporal directions positive events outnumbered negative events and the latter were significantly less detailed. A word cue study by Spreng and Levine (2008) found that the *retention function* for remembered events was mirrored by an inverse '*intention function*' for future events, which decreased monotonically as a function of distance from the present.

Past and future events also differ in some important ways: thoughts about the future are less likely to concern specific events than are memories about the past (Berntsen & Jacobsen, 2008), and future events are represented with less sensorial and contextual detail than are remembered events (D'Argembeau & Van der Linden, 2004). People remember their pasts as containing a greater mixture of positive and negative experiences, but tend to imagine futures that are generic, idealised and positive (Newby-Clark & Ross, 2003). The Berntsen and Jacobsen (2008) study is particularly relevant to the present studies, as it directly tested for the presence of cultural scripts in prospective events, and although scripted events were found in low numbers overall, their frequency increased with temporal distance, peaking for events more than five years into future. As their participants were on average 25 years old it seems that most of their scripted events fell within the bump period. At the same time, event specificity decreased with temporal distance, so the scripted events tended also to be more general in nature.

### *3.1.1 Thinking about past and future life scripts*

A primary function of scripts and schemas is to help structure knowledge and facilitate the planning and execution of future behaviour, whether for routine daily events such as eating in restaurants (Schank & Abelson, 1977; Schank, 1982) or for

culturally determined life transitions (George, 1993). The major life events associated with childbirth/child rearing, education, career, marriage and retirement follow a timetable that is culturally prescribed and sanctioned by social institutions and family members. People are sensitive to age-appropriate norms and know when they are “on time” or not (Neugarten, Moore & Lowe, 1965). As described in Chapter 2, Berntsen and Rubin (2002; 2004; Rubin & Berntsen, 2003) applied the template of the script to timetables derived from the age-norm literature and came up with the life script, which locates many of the normative transitions within the reminiscence bump period. Evidence supporting life scripts was obtained by asking people to estimate when in a prototypical life course certain positive and important events would be expected to occur. Such estimates were obtained for an average 70 year old (Rubin & Berntsen, 2003; Study 1), a hypothetical 100 year old, and a prototypical newborn (Berntsen & Rubin, 2004; Studies 1 & 2 respectively). The resulting distributions produced a bump in the second and third decades for positive, but not negative events and these distributions overlapped significantly with those produced from recall data in previous studies (Berntsen & Rubin, 2002, Study 2; Rubin & Berntsen, 2003, Study 1), thus confirming the hypothesis that life scripts explain the reminiscence bump. Similar results have recently been obtained in a Turkish sample using similar methods (Erdogan, Baran, Avlar, Tas & Teckan, 2008).

### *3.1.2 Thinking about where things might go wrong in life: the preminiscence bump*

Asking people to speculate about prototypical lives probes their implicit theories about the patterns of long-term action that make up the life course (Clarke, 1995). Rubin and Berntsen, (2003; Berntsen & Rubin , 2004) did not ask their

younger participants to make predictions about their own futures, but had they done so it is likely that distributions similar to those predicted for an average person would have been found. Such a request would elicit thoughts about what is deemed important and therefore regret-worthy in life, which implicates many of the landmark transitions captured by the life script. Students in a study by Klinger, Barta and Maxeiner (1980) for instance were asked to list seven things they thought about either often or rarely: negative events were more frequently thought about than positive events and these thoughts were often about threatened relationships or goals.

Thinking *prefactually* (Gleicher et al., 1995) about what might go wrong in life means holding negative outcomes up for consideration (a failed career, a childless retirement, an unfulfilled ambition) and then locating the possible source of these outcomes. Whereas a counterfactual poses the question; ‘where did things go wrong in life?’ the prospective equivalent asks; ‘where might things go wrong in life?’ The life script supplies plausible answers to both questions by implicating the important and consequential transitions of early adulthood. Johnson and Sherman (1990) suggest that such “counterfactual future thinking” appropriately reflects how people think about future events which have a high probability of occurring.

Expectations about how things might be expected to unfold (and therefore how these expectations might be violated) are constrained by norms, and so the future, rather than being a blank canvass of possibility, is actually quite predictable. People struggle to overcome the inertia of normality when thinking about the future, and because atypical events are more difficult to imagine than typical events, people tend to predict a future “where highly probable events occur too often and improbable events occur too infrequently” (Johnson & Sherman, 1990, p. 502). Future events certainly appear to be more generic (D’Argembeau & Van der Linden, 2004;

Newby-Clark & Ross, 2003) and more likely to comprise culturally-scripted events (Berntsen & Jabobsen, 2008).

### *Overview of the studies and their predictions*

If autobiographical memory is primarily an archive of goals and achievements (Conway & Pleydell-Pearce, 2000) then imagined futures should represent an agenda of goals to be achieved and expectations to be fulfilled. Many future events described by Newby-Clark and Ross (2003) concerned desirable goals to do with education, work, marriage, family and travel, and these domains were also rated high in importance and self-relevance. D'Argembeau and Van der Linden (2004) observed few differences in the content of past and future events, and the lists of both positive and negative events included romantic relationships, family, relatives, success/failure at school, success/failure at work, weddings and childbirth. Berntsen and Rubin (2004) suggest that the transitional experiences captured by life script are essentially extended general level events (Barsalou, 1988) nesting many other specific scripted events. If such events are deemed important and regret-worthy then the content and timing of young people's anticipated general regrets should resemble the experienced general regrets found for older adults in Studies 1 and 2, in that they will concern similar life domains and be disproportionately represented in the period of early adulthood, producing a *preminiscence bump*. Based on the view that people share knowledge of life scripts (Clarke, 1995), and on research showing that people use their own experiences to make inferences about the likely behaviour of others (Karniol, 2003; Ross, Greene & House, 1977), similar patterns are expected to be attributed to the anticipated regrets of others. Also, based

on the findings of the studies comparing past and future thought, it is expected that anticipated regrets will be disproportionately general in nature.

These predictions are examined in a series of 4 studies involving predominantly people currently living through the reminiscence bump period of their lives, which is defined as the period between the ages of 10 and 30 years. In Study 3 young people describe their experienced regrets, designate them as specific or general, and rate them on measures of past and present intensity, and likely persistence over time.

Participants then describe up to five things they anticipate regretting in the future and rate the likelihood that these regrets will persist into old age. The content of both the experienced and imagined regrets is expected to reflect the same life domains that were found in the experienced regrets of older adults in Studies 1 and 2 and in the regret literature (Roese & Summerville, 2005). Consistent with Studies 1 and 2, a significant overlap is also expected between the two dimensions of regret type and agency, such that general regrets will tend to concern inactions, while specific regrets will be more frequently attributed to action. The temporal distribution of general anticipated regrets is expected to show a ‘preminiscence bump’ in early adulthood. Since the life script does not determine the distribution of specific regrets, no bump is expected for these regrets.

In Study 4a a second group of young people describes up to five things they could imagine regretting when reviewing their lives from the eve of their 70<sup>th</sup> birthday. These regrets are coded for content and categorised along the specific-general and action-inaction dimensions. Regret content is expected to match that previously reported, and again it is expected that greater numbers of these anticipated regrets will concern general script-like events and that they will tend to



describe regrets of inaction. A ‘preminiscence bump’ for general regrets is expected in decades two and three. Predictions regarding the distribution of specific regrets are the same as those described already for Study 3.

A more direct test of the script account is carried out in two further studies. Study 4b asks people in their bump years to imagine what an average person of their age might regret when looking back from the eve of their 70<sup>th</sup> birthday. Study 4c asks a group to perform a similar task, but the descriptions they produce are then given to a separate group of judges who estimate when in the lifespan these events are most likely to occur. Predictions for these studies are similar to those made for the preceding two studies in terms of content, temporal distribution, overlap between the distinctions and specificity.

Because the studies are very similar in design and because broadly similar results are predicted across the studies, the discussion of the four studies is reserved for the end of the chapter in order to avoid unnecessary repetition.

### **3.2 Study 3: the experienced and anticipated regrets of young adults**

Although the studies to be reported are principally concerned with establishing a preminiscence bump for imagined regrets, this first study in the sequence also asks a group of young adults to describe their remembered regrets in order to examine the content and structural properties of the experienced regrets of young people currently living through the reminiscence bump period. The purpose of this is twofold. First, because the intention was to ask young adults in later studies to describe their imagined regrets, it was deemed important to first establish what participants of that age already regret, so that comparisons can be made between the actual and imagined regrets of bump-age adults. Second, it allows for a

comparison between the regrets of those currently living in the bump, and the regrets reported by people in their 40s and 60s *for that same period*. If certain categories of experience are found to recur then this may indicate an underlying script.

### *3.2.1 Method*

#### *Participants*

An opportunity sample was recruited from the Durham area comprising mostly students, along with some members of the general public. Recruitment was carried out by direct request, (verbally or by e-mail), or through contacts who distributed questionnaires to friends, housemates and colleagues etc. Approximately 250 questionnaires were distributed and there were 58 usable responses. Of the 58 respondents, 41 were female and 17 were male. Ages ranged from 18 to 25 years ( $M = 21.8$ ,  $SD = 2.2$ ). Respondents supplied information about their highest level of academic achievement and the academic profile of the sample was as follows: 2 participants had completed secondary education, 21 had completed advanced secondary education, 23 had degrees or a vocational equivalent, while 12 had postgraduate degrees or a vocational equivalent. Respondents received questionnaires by post, through contacts or in person from the researcher. Responses were by post.

#### *Design, Materials and Procedure*

The study employed a within subjects design in which all participants were asked to describe and answer questions about their own experienced and anticipated regrets as part of a postal survey. Respondents received a questionnaire (see Appendix A) contained in a stamped, self-addressed envelope. Each questionnaire

contained two sections, which will be described separately. The first section was for experienced regrets, and the second was for anticipated regrets. The cover sheet was for the questionnaire as a whole and it was identical to the one used in Studies 1 and 2 with the exception of a sentence indicating that the researcher was interested in *“what people regret in their lives, when these regrets occur, how strongly they feel about them, and how they expect to feel about them in the future.”*

Consent was indicated by ticking a box. On a separate sheet were numbered spaces for experienced regret descriptions, and at the top of the page respondents received instructions to *“look back on your life so far and the things you have regretted, or regret still. Please use the spaces provided below to describe in one sentence each of the regretted experiences. There are 5 spaces provided, but don’t worry if you have fewer than 5 regrets. It is important however that each description corresponds to only one of the numbers on the left and doesn’t run over into the next space.”*

The rest of the section for experienced regrets comprised question sheets. A separate sheet was provided for each regret, and the same questions were repeated on each sheet. The structure of the questionnaire was such that the sheet for writing down regret descriptions was presented first, and it was assumed that participants would first describe all of their regrets before answering the relevant questions, though no explicit instructions were given to this effect.

On each question sheet respondents first had to designate the corresponding regret as being either specific or general, after which they answered the questions relevant to that type of regret. A specific regret was defined as one directly caused by a specific experience. There were two categories of specific regret to choose between, one for events where the regret followed immediately and the other for

where regret was triggered by subsequent events. For a regret of the first type participants simply dated the regrettable experience. For a regret of the second type, they dated the experience, and then provided the date at which they began to regret the experience. A third question concerned general regrets, which were defined as concerning any non-specific experiences. Since the temporal location of the source experience for general regrets was not a critical factor in this study (as it had been in Studies 1 and 2), respondents simply indicated when they had become conscious of feeling regret. For all three types of regret participants provided dates by estimating their age at the time.

After they had designated and dated each of their regrets respondents then provided estimates of persistence and intensity over time for each regret described. For the persistence item they indicated how likely they thought it was that their regret would persist; '*ten years into the future*', and '*till the end of your life*'. Each response was indicated on an 11 point scale anchored at 0 (not at all likely) and 10 (absolutely certain).

In a separate box participants were asked to think about the feelings caused by the regretted experience and to rate how intense the regret.... i) *was at the time* [specific regrets only], ii) *is now*, iii) *will be in ten years time*, and iv) *will be when you reach the end of your life*. Participants indicated their responses by circling the appropriate number on a 10 point scale anchored at 1 (very mild) and 10 (very intense), or by circling 'N/A' where the question was not applicable because the regret had been rated in the previous question as 'not at all likely' to persist. In the second section of the same questionnaire respondents were asked about regrets they anticipated for events in the future. A separate sheet contained the following instructions:

*We would like you to think about the life ahead of you and imagine the choices, goals, expectations and experiences you anticipate for the future. We would like you to think about how you might feel if the things you anticipate in your life don't turn out as planned. Which of these things are you likely to regret and when? Please try to imagine yourself in your 60's looking back on your life and use the spaces provided to describe the things you are likely to regret. Please describe in one sentence each of the experiences you anticipate regretting if things don't go to plan. There are 5 spaces provided, but don't worry if you can't think of 5 experiences. It is important however that each description corresponds to only one of the numbers on the left and doesn't run over into the next space*

On a separate sheet there were five numbered question boxes, each one corresponding to a numbered space on the previous page where the anticipated regrets were described. For each regret the same two questions were asked; the first required respondents to indicate when in the future the experience they anticipated regretting was likely to occur by stating how old they would be at that time. Next they were asked how likely they thought it was that the regret they anticipated would persist into old age, which was defined as their 60s. They indicated their response by circling the appropriate number on an 11 point scale anchored at 0 (not at all likely) and 10 (absolutely certain).

### 3.2.2 Results: experienced regrets

In total, 199 regrets were produced, 127 of which were designated as specific and 72 of which were designated as general. Examination of the responses however revealed miscategorisation similar to that observed in Study 1 and in Davison (2005), such that many specific regrets had been wrongly designated, with the most frequent error being one of overgeneralisation. Typical overgeneral responses are; *“Not working hard enough at school for A levels”*, *“Getting too drunk on many occasions”*, *“Not going out more at university”*, and *“Investing too much time into a relationship”*; all of these were initially designated as specific regrets. In line with the procedure adopted in Study 1 and Davison (2005), two independent judges<sup>1</sup> recategorised all regrets and differences were settled by a third independent judge. Agreement was acceptable ( $Kappa = .77$ ) and recategorisation produced totals of 60 specific and 139 general regrets. Recategorisation resulted in there being very few observations in the category of specific regrets where the feeling of regret was triggered by subsequent events (i.e., telling someone a secret which they later disclose to someone else, leading to regret for sharing the confidence) so the two categories of specific regret were collapsed into one. Following recategorisation there were more general than specific regrets and this difference was tested for statistical significance using a single-sample t-test, which showed that the proportion of general regrets ( $M = .69$ ,  $SD = .31$ ) was significantly greater than would be expected by chance;  $t(57) = 4.34$ ,  $p < .001$ ,  $r = .50$ .

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<sup>1</sup> Unless otherwise specified, the different types of coding (regret type; agency; regret content) were carried out by different pairs of judges. Different moderators were also used for each type of coding.

A preliminary ANOVA revealed that the number of experienced regrets produced by participants was not significantly affected by sex  $F(1, 50) = .01$ ,  $MSE = 1.21$ ,  $p > .05$  or level of education  $F(3, 50) = 1.90$ ,  $MSE = 1.52$ ,  $p > .05$ .

*Analysis of the overlap between regret type by agency*

Using the coding method described earlier, two hypothesis-blind judges designated each regret as being due to action, “*Drinking so much at a young age*” (31%); inaction, “*Not trying harder for exams*” (50%); both action and inaction, “*Not moving away to university and living at home instead*” (4%); and neither action nor inaction, “*Being sad for periods of my life*” (15%). Inter-rater agreement was acceptable ( $\kappa = .73$ ) and differences were settled by a third independent moderator.

The proportions of specific and general action and inaction regrets were entered into a 2 (regret type: specific/general) by 2 (agency: action/inaction) ANOVA. As would be expected from the single-sample t-test reported above, the analysis produced a main effect of regret type,  $F(1, 57) = 14.17$ ,  $MSE = .08$ ,  $p < .001$ ,  $\eta_p^2 = .19$ . The analysis also produced a main effect of agency,  $F(1, 57) = 7.51$ ,  $MSE = .07$ ,  $p < .01$ ,  $\eta_p^2 = .17$ , such that higher proportions of participants’ regrets were due to inaction ( $M = .50$ ,  $SD = .31$ ) than to action ( $M = .31$ ,  $SD = .28$ ). There was also a significant interaction between agency and regret type,  $F(1, 57) = 21.87$ ,  $MSE = .06$ ,  $p < .001$ ,  $\eta_p^2 = .28$ . Planned comparisons of the means in the interaction revealed that participants’ general regrets were significantly more likely to be due to inaction ( $M = .39$ ,  $SD = .29$ ) than to action ( $M = .15$ ,  $SD = .22$ );  $t(57) = 4.60$ ,  $p < .001$ ,  $r = .52$ . Although on average, participants described more specific regrets that were due to action ( $M = .16$ ,  $SD = .23$ ) than they did specific regrets due to inaction

( $M = 11$ ,  $SD = 18$ ), this difference did not reach significance;  $t(57) = 1.38$ ,  $p = .17$ ,  $r = .18$ .

#### *Estimates of persistence and intensity over time*

The estimates of persistence and intensity used in this study are similar to those used in Study 2 with the exception that the present ratings include an extra temporal index, so participants were asked to estimate the likelihood that their regrets would persist ten years into the future, as well as to the end of their lives. As with Study 2, ratings were given on an 11 point scale anchored at 0 (not at all likely) and 10 (absolutely certain). The intensity ratings were given on a scale anchored at 1 (very mild) to 10 (very intense). In total 31 participants reported having at least one regret of each type and in total 101 regrets were included in the analysis. The descriptive statistics for the analysis are presented in Table 3.1.

*Persistence.* As can be seen from Table 3.1, the mean persistence ratings for P2 (the end of life) are lower than the ratings for P1 (10 yrs into the future) for both types of regret, indicating that regrets were expected to become less persistent over time. These differences were tested statistically by means of a 2 (regret type; specific/general) by 2 (time; 10 yrs/end of life) ANOVA. There was no significant main effect of regret type,  $F(1, 30) = .64$ ,  $p > .05$ , but there was a significant main effect of time,  $F(1, 30) = 12.33$ ,  $MSE = 3.03$ ,  $p < .01$ ,  $\eta_p^2 = .31$ , such that persistence ratings overall decreased significantly between P1 ( $M = 4.40$ ,  $SD = 2.10$ ) and P2 ( $M = 3.26$ ,  $SD = 1.97$ );  $t(31) = 3.91$ ,  $p < .001$ ,  $r = .57$ . The two way interaction between regret type and time was non significant,  $F(1, 30) = .36$ ,  $p > .05$ , and so the pattern of decreased persistence applied equally to both specific and general regrets.



**Table 3.1 Experienced regrets: ratings of persistence and intensity across time for specific and general regrets, with means, standard deviations and number of observations (n).**

	Specific		General	
	n = 45		n = 56	
	M	SD	M	SD
<i>Persistence</i>				
<i>P1 (10 yrs into future)</i>	4.08	(3.33)	4.72	(2.82)
<i>P2 (To the end of life)</i>	3.06	(3.08)	3.46	(2.54)
<i>Intensity</i>				
<i>T1 (At the time)</i>	7.60	(2.60)	6.19	(2.66)
<i>T2 (Now)</i>	5.45	(2.20)	4.64	(2.17)
<i>T3 (10 yrs into future)</i>	4.51	(2.28)	4.50	(1.87)
<i>T4 (At the end of life)</i>	3.45	(2.35)	4.02	(2.44)

*Intensity.* The mean intensity ratings in Table 3.1 show a decrease over time for both types of regret and this pattern was analysed by means of a 2 (regret type: specific/general) by 4 (time: then, now, in 10 yrs, to the end of life) repeated measures ANOVA. As with the previous analysis there was no significant main effect of regret type  $F(1, 14) = 3.12, p > .05$ , but there was a significant effect of time,  $F(1.7, 24.3) = 11.30, MSE = 5.32, p < .01, \eta_p^2 = .45$ . There was no significant two way interaction between regret type and time  $F(1.7, 24.3) = 1.81, p > .05$ .

Tukey HSD post hoc analysis on the main effect of time showed that the intensity of regret had decreased significantly between T1 ( $M = 6.90, SD = 2.12$ ) and T2 ( $M = 5.12, SD = 1.46$ );  $t(25) = 4.51, p < .01, r = .67$ , and the ratings at T3 ( $M = 4.66, SD = 1.69$ ) and T4 ( $M = 3.77, SD = 1.84$ ) were also significantly lower than at

T1 (both  $p$ s  $<.01$ ,  $r$ s  $.64$  and  $.76$  respectively). There was no significant decrease expected between T2 and T3 ( $t = 2.22$ ,  $p >.05$ ,  $r = .47$ ) but intensity was expected to decrease significantly between the present (T2) and the end of life (T4);  $t = 5.03$ ,  $p <.01$ ,  $r = .80$ . Regret intensity was also expected to decrease significantly between T3 and T4;  $t = 3.61$ ,  $p <.01$ ,  $r = .67$ .

To sum up these results then; the persistence ratings for both types of regret are below the midpoint, so these participants did not feel strongly that their regrets would persist into the future, and they expected their regrets to become significantly less persistent towards the end of life. In terms of intensity, for both types of regret the intensity of feeling had decreased significantly since the time of the regrettable experience. Participants did not expect the intensity to decrease significantly in the near future, but only towards the end of life.

#### *Analysis of content*

A primary interest of this study was to see what experiences people living in the bump period actually regret and whether they resemble the regrets remembered from the same period by older adults. To this end an analysis of content was carried out using the coding system employed in Studies 1 and 2. Two independent judges reached acceptable agreement ( $\kappa = .73$ ). Differences were settled through moderation by the researcher. Using individual regrets as the units of analysis the main domains were ranked in descending order as follows: *Education*, “Choosing the wrong modules for the final year” (14%); *Character*, “Not being able to control my temper” (14%); *Family*, “Hurting my parents with my actions” (13%); *Intimate relationships*, “Not trying harder to make a relationship work” (12%); *Friendships*,

“Losing touch with friends from college” (10%); *Self-development*, “That I haven’t fulfilled my ambitions” (5%).

As can be seen, the domains do not differ greatly in terms of their relative frequency, but what is clear is that they are consistent both with the domains reported by the older participants in Studies 1 and 2, and also with the domains reported in the regret literature (Roese & Summerville, 2005). One notable difference is the absence from the list of the domain of *work/career*, which is to be expected given the age of these participants, the majority of whom were still in education at the time the questionnaire was completed. Roese and Summerville report the same age-specific difference between the ranking they found in their meta-analysis and the ranking produced by their own students. The themes represented in the rankings also reflect findings from research into self-defining memories which suggest that relationships, achievement and leisure are frequent preoccupations in this age group (Blagov & Singer, 2004; Thorne, McLean & Lawrence, 2004).

#### *Summary of the findings for experienced regrets*

Consistent with Studies 1 and 2, there is evidence of an overlap between the two distinctions of specificity and agency, as general regrets were more than twice as likely to concern inactions as actions. However, the specific-action overlap was less clear.

The study also considered whether the experiences regretted by bump-age adults are similar to the experiences regretted *from the bump period* by older adults, and on the whole it seems that they are. The most frequently reported regrets were in the domains of character, education, family, friendships, intimate relationships, and self-development and these domains are broadly consistent with the experiences

reported by participants in their Studies 1 and 2. One exception was in the domain of work/career, which did not feature among the regrets of young people for reasons that are predictable given their age, as was also found by Roese and Summerville (2005, Study 1) in their analysis of college students' regrets.

The results of the first part of Study 3 show that people in the bump period of their lives regret similar things to those regretted by older adults for the same period. The question asked in the next part of the study is what do they anticipate regretting from the life ahead of them?

### 3.2.3 *Results: anticipated regrets*

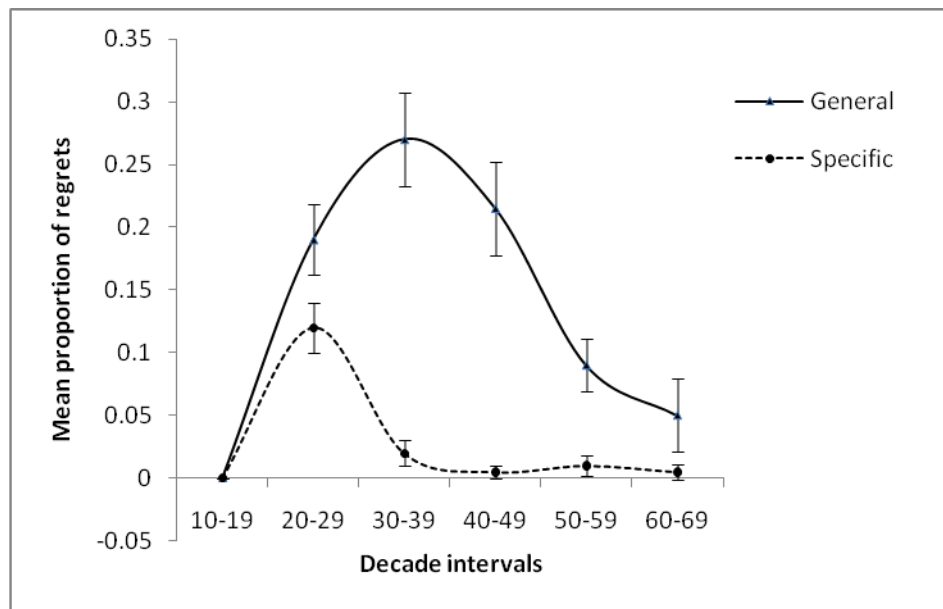
For this and the three following studies the proportions of specific and general anticipated regrets were calculated for each participant in each decade and the resulting distributions are presented graphically. Tables containing the proportions are presented in Appendix B.

Overall the sample in Study 3 produced 163 anticipated regrets, three of which had been assigned to the 8<sup>th</sup> decade and so were excluded in order to keep the number of decades consistent with Studies 1 and 2. Seven participants did not provide anticipated regrets, and one participant provided but did not date his two anticipated regrets; these eight participants were therefore excluded from the analysis. The 158 remaining regrets were coded along the specific-general dimension by two independent judges, who reached acceptable agreement ( $\kappa = .64$ ). Differences were resolved through discussion. There were 136 general and 22 specific regrets. An analysis similar to that carried out on the experienced regrets showed that the number of anticipated regrets produced by each participant was not

affected either by sex,  $F(1, 42) = .004$ ,  $MSE = 1.35$ ,  $p > .05$ , or level of education,  $F(3, 42) = 1.25$ ,  $MSE = 1.35$ ,  $p > .05$ .

### *Temporal distribution*

Respondents dated their anticipated regrets by giving their expected age at the time, but for consistency with Studies 1 and 2 these dates were converted to decades. Respondents were asked to imagine which *future* events they anticipated regretting, the future being defined as extending only into their sixties. It was necessary to take into account the fact that many respondents had already lived through some of the third decade, while others had not yet entered it, meaning that some participants had less future available to them in which to encounter regrettable experiences. To correct for this, an adjustment was calculated to give the number of extra regrets that would have been produced had all participants completed the questionnaire on the eve before entering the third decade (the eve of their 20<sup>th</sup> birthday). The adjustment, adapted from Berntsen and Rubin (2003), was similar to that applied to the recency component of older adults' regrets in Studies 1 and 2 (see Appendix C) and it produced 17 extra regrets that could have been anticipated had the whole of decade 3 been available to all participants. These regrets were then distributed between categories according to the relative proportions of specific and general regrets in this decade. The adjustment resulted in totals of 29 specific and 146 general regrets. A single sample t-test revealed that participants produced significantly greater numbers of general anticipated regrets ( $M = .83$ ,  $SD = .22$ ) than would be expected by chance;  $t(49) = 10.78$ ,  $p < .001$ ,  $r = .84$ .



**Figure 3.1 Study 3: proportion of participants' own anticipated regrets as a function of time in decade intervals for specific and general regrets. Error bars represent the standard error of the mean.**

The distributions of specific and general anticipated regrets are presented in Figure 3.1, and the first thing to note about the distributions is that there are no regrets anticipated for the 2<sup>nd</sup> decade, even though 10 participants were still living in that decade and could plausibly expect to have regrettable experiences before it ended. This suggests that the instruction to think about the future prompted these respondents to look beyond their current or approaching year. Also of interest is the fact that specific anticipated regrets are clustered almost entirely in the 3<sup>rd</sup> decade, while the majority of general anticipated regrets are located in decades 3, 4 and 5, with the peak in the 4<sup>th</sup> decade. The between-decade differences were analysed for both distributions separately; for general anticipated regrets the proportions of regrets in each decade (excluding decade 2) were entered into a repeated measures ANOVA. Due to the very low count of specific anticipated regrets in this and

subsequent studies, a non-parametric equivalent (Friedman's) was used. Post hoc comparisons within specific regrets are carried out using a Wilcoxon test. In all analyses of specific regret distributions the bump decades individually are compared with the combined proportions of all other decades beyond the bump.

The analysis of general anticipated regrets revealed a significant main effect of decade,  $F(4, 196) = 6.34$ ,  $MSE = .06$ ,  $p < .001$ ,  $\eta_p^2 = .11$ . Tukey HSD post hoc tests showed this effect to be attributed mainly to decade 4 ( $M = .27$ ,  $SD = .20$ ) which contained significantly higher proportions of anticipated general regrets than decades 6 ( $M = .09$ ,  $SD = .15$ );  $t(49) = 4.32$ ,  $p < .01$ ,  $r = .52$ , and 7 ( $M = .05$ ,  $SD = .21$ );  $t(49) = 3.63$ ,  $p < .01$ ,  $r = .46$ ). Decade 5 ( $M = .22$ ,  $SD = .26$ ) also contained significantly higher proportions than decade 6;  $t(49) = 3.11$ ,  $p < .05$ ,  $r = .41$ .

As would be expected from the distribution in Figure 3.1, a Friedman's analysis of the specific anticipated regret distribution revealed a significant effect of decade,  $\chi^2(4) = 167.94$ ,  $p < .001$ , that was due entirely to decade 3 ( $M = .12$ ,  $SD = .17$ ) which contained significantly higher proportions than the combined proportions of all subsequent decades ( $M = .04$ ,  $SD = .12$ );  $Z = 4.50$ ,  $p < .001$ ,  $r = .83$ .

A comparison of the proportions of general and specific anticipated regrets in decade 3 showed that although there were slightly higher proportions of general than specific regrets, the difference did not reach significance,  $t(49) = 1.74$ ,  $p = .09$ ,  $r = .24$ .

This analysis suggests that the general regrets anticipated in the future by this sample lie predominantly in the period spanning the 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> decades of life, although there are still some regrets anticipated for the 6<sup>th</sup> and 7<sup>th</sup> decades. By contrast, 76% of the specific regrets are expected to concern experiences in the very near future.

### *Likely persistence of anticipated regrets*

Participants rated the likelihood that the regrets they anticipated would persist into their sixties. Some participants dated the *experiences* they anticipated regretting as likely to occur in their sixties, so only the ratings from regrets in the preceding decades were used, and a comparison was made between the mean ratings of both types of regret for those participants who described at least one of each type, which was only 15 participants. The mean persistence ratings for general regrets (8.05, SD = 2.34) were significantly higher than the same ratings for specific regrets (6.25, SD = 3.02);  $t(13) = 2.44$ ,  $p < .05$ ,  $r = .56$ , so future general regrets were expected to be more enduring than were future specific regrets.

### *Analysis of the overlap between regret type and agency*

Two hypothesis-blind judges coded the anticipated regrets that were attributed to action, “*Making bad career choices*” (19%); inaction “*Not spending enough time with family*” (66%); both action and inaction “*Bringing children into the world then failing to teach them how to deal with it*” (1%); and neither action nor inaction “*Never having enough money* (14%). The judges reached acceptable agreement (Kappa = .73) and disagreements were resolved through discussion.

After adjusting for the 17 extra regrets, the proportions were calculated for each participant’s regrets that were specific actions (“*A decision I have to make in the near future*”), specific inactions (“*Not passing an aptitude test for the RAF*”), general actions (“*Probably regret the way I manage money*”) and general inactions (“*Not completing my PhD by the age of 28*”), and these were entered into a 2 (regret type: specific/general) by 2 (agency: action/inaction) ANOVA.



As might be expected, the analysis produced a significant main effect of regret type,  $F(1, 49) = 141.30$ ,  $MSE = .04$ ,  $p < .001$ ,  $\eta_p^2 = .74$ , with significantly higher proportions of general than specific regrets. There was a significant main effect of agency  $F(1, 49) = 35.03$ ,  $MSE = .08$ ,  $p < .001$ ,  $\eta_p^2 = .42$ , such that on average participants described significantly more regrets due to inaction ( $M = .66$ ,  $SD = .34$ ) than to action ( $M = .19$ ,  $SD = .28$ ). There was also a significant two way interaction between regret type and agency,  $F(1, 49) = 25.99$ ,  $MSE = .08$ ,  $p < .001$ ,  $\eta_p^2 = .35$ . Planned contrasts of the means involved in the significant interaction revealed that general regrets were significantly more likely to describe inactions ( $M = .57$ ,  $SD = .30$ ) than actions ( $M = .16$ ,  $SD = .22$ )  $t(49) = 5.95$ ,  $p < .001$ ,  $r = .65$ . Although specific regrets were more likely to be due to inaction ( $M = .09$ ,  $SD = .14$ ) than action ( $M = .03$ ,  $SD = .09$ ), the difference failed to reach significance,  $t(49) = 1.34$ ,  $p > .1$ ,  $r = .23$ .

#### *Analysis of content*

Two hypothesis-blind judges coded the anticipated regrets for content and reached acceptable agreement ( $\kappa = .71$ ). Using regrets as the units of analysis the main domains were ranked by frequency in the following descending order: *Work*, “Choosing the wrong career” (18%); *Family*, “Not having a family” (17%); *Intimate relationships*, “Staying in a relationship that is not right” (10%); *Education*, “Not being successful in chosen degree” (8%); *Travel* “Not travelling more” (8%); *Friendships*, “Losing contact with good friends” (7%); *Material* “Missing out on the right house” (6%) *Self-development*, “Not following my dreams” (5%).

The domains in which this group anticipated having most of their regrettable experiences are similar to the domains in which they reported having already

experienced regret; education, family, and intimate relationships are important in both cases, and to a lesser extent friendships and self-development. A predictable difference given the age of the sample lies in the domain of work, which comes top of the list of anticipated regrets but does not make the top six domains of experienced regrets. Travel is also a future-oriented concern, as might also be expected in such a young sample.

#### *3.2.4 Summary of Study 3*

As was found with the experienced regrets in this study, the anticipated regret descriptions were predominantly general in nature, accounting for about 80% of the total number of anticipated regrets. As predicted by the studies of prospective thinking (Berntsen & Jacobsen, 2008; Spreng & Levine, 2008) and temporal construal (Liberman & Trope, 1998; Liberman, Sagristano & Trope, 2003), almost all of the specific regrets concern events in the near future. General anticipated regrets on the other hand extend further into the future and peak in the fourth decade. General regrets were also expected to persist further into the future than were specific regrets. In line with the results already reported in Studies 1 and 2, there was a significant overlap between the specific-general and action-inaction dimensions, which is strong for general inactions, but less stable for specific actions. In terms of content, similar domains made up the experienced and anticipated regrets of this sample.

### **3.3 Study 4a: young adults predict their own life regrets**

Because participants in Study 3 described their experienced regrets before describing their anticipated regrets, the temporal distribution shown in Figure 3.1

represents a shortened lifespan, as it excludes past and current regrets. This is evident in the absence of regrets anticipated for experiences occurring in the 2<sup>nd</sup> decade, the effective removal of which may explain why the bump is displaced to the 4<sup>th</sup> and 5<sup>th</sup> decades. The present study addresses this matter by allowing participants in the same age group to include experiences from any part of their lifespan, whether they belong to the past, present, or future.

### *3.3.1 Method*

#### *Participants*

A total of 65 undergraduates from Durham University's Queen's Campus, Stockton participated in this study. The sample consisted of 12 males and 53 females and their ages ranged from 18 to 26 years, with the mean age of 20 years (SD = 1.7yrs).

#### *Design, Materials and Procedure*

As with the previous study, a within-participants design was employed in which participants supplied anticipated regrets of both a specific and general nature. Participants were introduced to the aim of the study both verbally, while the materials were being distributed, and by means of a cover sheet on the front of the questionnaire, which read as follows:

*This study is concerned with establishing cultural norms related to certain types of experience. In particular it is concerned with identifying the kinds of experiences people expect to regret in life. Regret is the emotion people feel when things don't turn out as they wished them to*

*and it may concern things they did or didn't do, bad decisions, unfulfilled ambitions, or something else. You will be asked to imagine what things you are likely to regret when looking back at your life from the eve of your 70<sup>th</sup> birthday. Then you will be asked to estimate when in your life those regrettable experiences are likely to have occurred. The study is anonymous and the only personal details you are asked to supply are age, sex, and whether English is your native language.*

Because the samples in this and the following two studies were drawn from a culturally diverse population, the question about English was included simply as a way of detecting any variation that might occur due to cultural factors. If there turned out to be many participants whose first language was not English then this would have been factored into the analysis. Since the vast majority of participants (94%, 88%, and 99% across the three studies) did put English as their first language, no such analysis was necessary and so this matter is not reported further. On a separate sheet participants were provided with five numbered spaces in which to describe their anticipated regrets. The task was explained to them as follows:

*I would like you to think about the life you will have lived by the time you reach the eve of your 70<sup>th</sup> birthday. Think of all your goals and expectations, all the choices you will have made, and all the experiences you wanted out of life. Imagine yourself looking back across your whole life and how you might feel if things haven't worked out as planned. What things are you likely to regret? Please use the spaces provided to*

*describe the things you are likely to regret by the time you reach the age of 70*

The remainder of the questionnaire consisted of question sheets containing numbered boxes, each corresponding to a regret description on the previous page. Participants were asked to

*Please consider each of the anticipated experiences you have described. Imagine looking back from the eve of your 70<sup>th</sup> birthday. Try to estimate when in your life each of the experiences you think you might regret is likely to have occurred (not the feeling of regret, which may have occurred later). Circle the appropriate decade.*

After the questionnaires had been completed and collected, participants were given a verbal debrief and were given the opportunity to ask questions.

### 3.3.2 Results

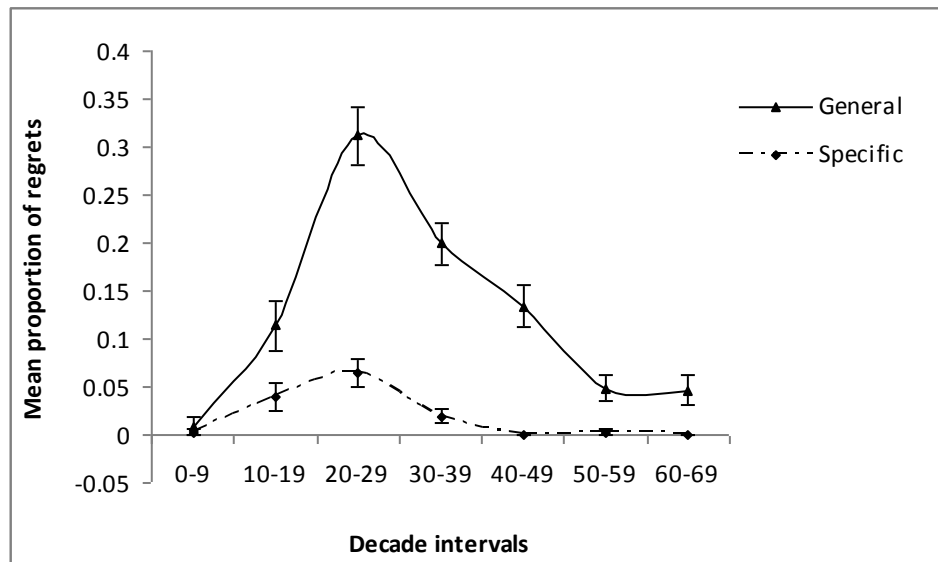
The study produced a total of 263 anticipated regrets. Participants produced on average 4 regrets each and a preliminary analysis showed that this average was not affected by sex,  $t(63) = 1.20$ ,  $p > .05$ . For 10 of these regrets participants had indicated more than one decade; sometimes circling two decades, sometimes a range. Where an odd number of decades was circled the middle decade was chosen, and where an even number was circled the most distant decade was chosen to give a conservative estimate. As with the previous study, the regrets were coded as either

specific or general by two independent judges, who reached acceptable agreement ( $\kappa = .74$ ). Differences were resolved by a third coder.

As with previous studies, the proportions of each participant's regrets that were specific and general were calculated. A single sample  $t$  test showed that this sample produced significantly higher proportions of general regrets ( $M = .87$ ,  $SD = .23$ ) than would be expected by chance;  $t(64) = 12.91$ ,  $p < .001$ ,  $r = .85$ .

### *Temporal distribution*

The distributions of specific and general anticipated regrets are presented graphically in Figure 3.2 and as can be seen the vast majority of these regret descriptions were general in nature, and approximately half (49%) of these general regrets were expected to concern events from the bump period. Whereas the distribution of general regrets in Study 3 peaked in decade 4, the peak in the present study is in the 3<sup>rd</sup> decade, although the bump overall still shows a shift towards the 4<sup>th</sup> decade. More than three quarters (78%) of specific anticipated regrets were expected to concern experiences occurring in the bump years, a pattern that is similar to that found in Study 3. There is only a single specific regret anticipated for the decades beyond the 30s, whereas almost a quarter of general anticipated regrets are spread over the latter three decades.



**Figure 3.2 Study 4a: proportion of participants' own anticipated regrets as a function of time in decade intervals for specific and general regrets. Error bars represent the standard error of the mean.**

As with Study 3 an analysis of each distribution was carried out separately; for general regrets the proportions were entered into a repeated measures ANOVA, which revealed a main effect of decade interval,  $F(3.5, 223.9) = 17.00$ ,  $MSE = .05$ ,  $p < .001$ ,  $\eta_p^2 = .21$ . Tukey HSD post hoc tests showed this effect to be driven by decade 3 ( $M = .31$ ,  $SD = .25$ ), which contained significantly higher proportions of general regrets than decades 2 ( $M = .11$ ,  $SD = .22$ ;  $t = 4.58$ ,  $p < .01$ ,  $r = .49$ ), 4 ( $M = .20$ ,  $SD = .18$ ;  $t = 3.07$ ,  $p < .05$ ,  $r = .36$ ), 5 ( $M = .14$ ,  $SD = .18$ ;  $t = 3.90$ ,  $p < .01$ ,  $r = .44$ ), 6 ( $M = .05$ ,  $SD = .11$ ;  $t = 6.69$ ,  $p < .001$ ,  $r = .64$ ) and decade 7 ( $M = .05$ ,  $SD = .13$ ;  $t = 6.67$ ,  $p < .01$ ,  $r = .65$ ). Decade 4 contained significantly higher proportions of general regrets than decade 6 ( $t = 5.24$ ,  $p < .01$ ,  $r = .55$ ) and decade 7 ( $t = 5.29$ ,  $p < .01$ ,  $r = .55$ ).

An analysis of the specific regret distribution using Friedman's test showed a significant effect of decade;  $\chi^2(5) = 48.83$ ,  $p < .001$ . Two Bonferroni-corrected post

hoc comparisons were carried out in which the regret proportions in decades 2 ( $M = .04$ ,  $SD = .12$ ) and 3 ( $M = .06$ ,  $SD = .12$ ) were each compared with the combined proportions of non-bump decades 4-7 ( $M = .02$ ,  $SD = .06$ ). There was no significant difference between the specific regret proportions in decade 2 and the proportions in decades 4-7;  $Z = 1.14$ ,  $p > .05$ ,  $r = .19$ , but the proportion of specific regrets in decade 3 was significantly greater than the combined proportions of decades 4-7;  $Z = 2.56$ ,  $p < .02$ ,  $r = .52$ . Decades 2 and 3 combined ( $M = .10$ ,  $SD = .18$ ) contained significantly higher proportions of anticipated regrets than the combined non-bump decades;  $Z = 3.70$ ,  $p < .01$ ,  $r = .62$ .

Planned comparisons of the general and specific regret proportions within the bump decades showed significantly higher proportions of general than specific regrets in decade 2,  $t(64) = 2.21$ ,  $p < .05$ ,  $r = .27$ , and also in decade 3,  $t(64) = 7.12$ ,  $p < .001$ ,  $r = .66$ .

#### *Analysis of the overlap between regret type and agency*

Two judges coded the anticipated regrets according to whether they were due to action, “*Working in jobs that I haven’t enjoyed*” (15%); inaction, “*That I never wrote a novel*” (75%); both action and inaction, “*Stopping education and not going on to a doctorate*” (9%); and neither an action nor an inaction, “*Losing a baby*” (1%). Acceptable agreement was reached and differences were resolved through discussion ( $Kappa = .72$ ). As with the previous studies the proportions were calculated for all specific actions/inactions and general actions/inactions, and these were entered into a 2 (regret type: specific/general) by 2 (agency: action/inaction) ANOVA.



As would be expected from the single sample t-test reported above, the analysis produced a significant main effect of regret type,  $F(1, 64) = 172.14$ ,  $MSE = .04$ ,  $p < .001$ ,  $\eta_p^2 = .73$ . There was a significant main effect of agency,  $F(1, 64) = 130.22$ ,  $MSE = .04$ ,  $p < .001$ ,  $\eta_p^2 = .67$ , such that there were significantly higher proportions of regrets attributed to inaction ( $M = .75$ ,  $SD = .25$ ) than to action ( $M = .15$ ,  $SD = .22$ );  $t(64) = 11.44$ ,  $p < .001$ ,  $r = .82$ . The two way interaction between regret type and agency was also significant,  $F(1, 64) = 98.61$ ,  $MSE = .05$ ,  $p < .001$ ,  $\eta_p^2 = .61$ . Planned comparisons of the means in this interaction revealed that general regrets were significantly more likely to be due to inaction ( $M = .68$ ,  $SD = .28$ ) than to action ( $M = .11$ ,  $SD = .19$ );  $t(64) = 11.61$ ,  $p < .001$ ,  $r = .82$ . Within specific regrets, higher proportions were attributed to inaction ( $M = .07$ ,  $SD = .15$ ) than to action ( $M = .04$ ,  $SD = .09$ ), but this difference was only marginally significant,  $t(64) = 1.78$ ,  $p = .08$ ,  $r = .22$ .

#### *Analysis of regret content*

Two coders rated the regrets for content and reached acceptable agreement ( $Kappa = .83$ ). The life domains in which most regrets were anticipated were ranked in descending order as follows; *Family* “Not spending enough time with my family” (20%); *Travel*, “Not having taken the opportunity to travel while still young” (11%); *Work/Career*; “Getting fired from a good job” (11%); *Intimate relationships*, “Not forming a loving relationship” (10%); *Self-development*“, Not living life to the full” (8%); *Character*, “Not being true to myself” (7%); *Education*, “Failing my degree” (6%); and *Health*, “Taking up smoking” (6%).

### 3.3.3 *Summary of Study 4a*

As with the previous studies, the vast majority of anticipated regrets were general and again were overwhelmingly regrets of inaction. The distribution of general regrets does suggest that changing the instructions to encompass the entire lifespan made a difference, as there is a clear peak in the 3<sup>rd</sup> decade for general regrets, although the bump is still skewed towards decade four, which contains more general regrets than decade two.

Studies 3 and 4a have dealt with regrets people anticipate experiencing in the course of their own lives, and in terms of content, relative proportions of regret types, temporal distribution and agency, there is considerable concordance between the two studies. Although this suggests some sort of collective expectation about what might be regretted in life, it does not provide any direct evidence that this expectation is projected onto the lives of others, which is a feature of the life script (Clarke, 1995; Rubin & Berntsen, 2003). The majority of participants in the two previous studies were students, so it is likely that as well as sharing current issues, they also share expectations about their future trajectories, which to some extent are shaped by similar constraints, as the decision to enter further education necessarily involves sacrificing other options. In Study 4a for example, all of the anticipated regrets concerning travel are about *not* travelling, which is clearly something many will have had to forego in order to go to university. Similarly, regrets to do with careers feature prominently, though they are more mixed in terms of action and inaction. So there is evidence that these participants are using their current experience to inform their forecasts. The next two studies move away from the focus on the self and require instead that participants imagine what other people are most likely to regret in life.

### **3.4 Study 4b: young adults predict the life regrets of a peer**

#### *3.4.1 Method*

##### *Participants*

The participants in this study were undergraduate students at Durham University's Queen's Campus. They were recruited from human sciences and psychology classes at different times. There were 81 participants in total, 54 females and 27 males, who ranged in age from 18 to 52 ( $M = 22$  yrs,  $SD = 7.5$  yrs). Despite the age range, only 10 participants were not currently in the bump years of their lives.

##### *Design, Materials and Procedure*

As with the previous two studies a within participants design was employed in which participants were free to supply both specific and general anticipated regrets. The cover sheet for this study was identical to the one used in Study 4a, with the exception of the following paragraph:

*You will be asked to imagine what experiences a person is likely to regret when looking back at their life from the age of 70. Then you will be asked to estimate when in that person's life those regrettable experiences are likely to have occurred.*

On a separate sheet participants received the following instructions:

*I would like you to think about the life that an average person who is your age today will have lived by the time they reach the eve of their 70<sup>th</sup> birthday. Think of all their goals and expectations, all the choices they will have made, and all the experiences they wanted out of life. Imagine that person looking back across their whole life and how they might feel if things haven't worked out as planned. What things are they likely to regret?*

Participants then described up to 5 regrets in the numbered spaces provided. On a separate sheet they were asked to consider each of the experiences they had described and to try to estimate when in the person's life **the regretted experience** is likely to have occurred (not the feeling of regret itself, which may have occurred later). For each regret there was a separate box containing instructions to complete the sentence; *"the experience this person regrets would have happened .....in decade"*, and then they circled the appropriate decade from a line anchored at 1 (0-9) to 7 (59-60).

Participants were given as long as necessary to complete the questionnaire and the whole session took no more than 10-15 minutes from the time the study was introduced to the collection of the questionnaire. After the collection of all questionnaires, participants were given a short debrief and an opportunity to ask questions.

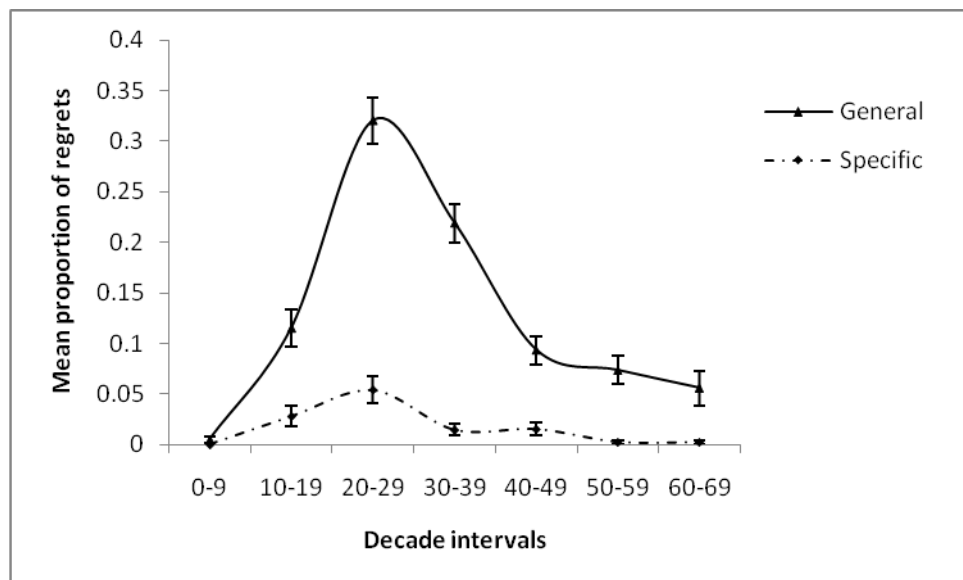
### 3.4.2 Results

On average each participant described 4 experiences an average person their age might regret on the eve of their 70<sup>th</sup> birthday, producing a total overall of 357

events. A preliminary analysis showed that the average total produced was not affected by sex,  $t(79) = 1.10$ ,  $p > .05$ . Two judges coded these events as either specific or general, reaching acceptable agreement ( $\kappa = .75$ ). Differences were resolved by a third coder. The coding resulted in category totals of 43 specific and 314 general regrets.

#### *Temporal distribution*

The distributions of specific and general anticipated regrets are presented in Figure 3.3 and they show that the experiences described are overwhelmingly general (88%), as was the case for anticipated regrets in studies 3 and 4a. A single sample t-test showed that the mean proportion of general regrets ( $M = .88$ ,  $SD = .17$ ) was significantly greater than chance;  $t(80) = 19.90$ ,  $p < .001$ ,  $r = .91$ .



**Figure 3.3 Study 4b: proportion of regrets predicted for a peer as a function of time in decade intervals for specific and general regrets. Error bars represent the standard error of the mean.**

What is striking about the distributions in Figure 3.3 is how similar they are to the distributions in Figure 3.2. In each case there is a pronounced bump for general regrets spanning decades 2 to 4 and peaking in the 3<sup>rd</sup> decade. Again the bump differs from that found in the experienced regrets of older adults (Studies 1 and 2) in that it has shifted towards the 4<sup>th</sup> decade, which contains more regrets than decade 2. Of the small number of specific regrets, 70% are in decades 2 and 3. The between-decade differences of both distributions were analysed as in Study 4a, using a one way repeated measures ANOVA for general regrets and Friedman's nonparametric test for specific regrets. Again, the first decade was excluded in both analyses to avoid weakening the analysis. For general regrets there was a significant effect of decade,  $F(4.2, 339.8) = 27.95$ ,  $MSE = .04$ ,  $p < .001$ ,  $\eta_p^2 = .26$ . Tukey HSD post hoc tests showed that decade 3 ( $M = .32$ ,  $SD = .20$ ) contained significantly higher proportions than decades 2 ( $M = .11$ ,  $SD = .17$ ;  $t = 6.63$ ,  $p < .001$ ,  $r = .59$ ), 4 ( $M = .22$ ,  $SD = .17$ ;  $t = 3.06$ ,  $p < .05$ ,  $r = .32$ ), 5 ( $M = .09$ ,  $SD = .13$ ;  $t = 7.63$ ,  $p < .001$ ,  $r = .65$ ), 6 ( $M = .07$ ,  $SD = .12$ ;  $t = 5.90$ ,  $p < .001$ ,  $r = .68$ ) and decade 7 ( $M = .06$ ,  $SD = .15$ ;  $t = 5.70$ ,  $p < .001$ ,  $r = .68$ ). Decade 4 also contained significantly higher proportions of general regrets than decade 2 ( $t = 3.31$ ,  $p < .05$ ,  $r = .35$ ) decade 5 ( $t = 4.93$ ,  $p < .001$ ,  $r = .48$ ), 6 ( $t = 5.90$ ,  $p < .001$ ,  $r = .55$ ) and 7 ( $t = 5.70$ ,  $p < .001$ ,  $r = .54$ ). None of the other between decade differences reached significance.

The analysis of specific regrets using Friedman's ANOVA showed a significant effect of decade;  $\chi^2(5) = 28.89$ ,  $p < .001$ . Wilcoxon pairwise comparisons using a Bonferroni correction showed this main effect to be driven by the difference between decade 3 ( $M = .05$ ,  $SD = .13$ ) and decades 6 and 7 (both  $M_s = .003$ , both  $SD_s = .02$ , both  $Z_s = 3.56$ , and both  $p_s < .001$ ). However, as decades 6 and 7 contain only one regret each this analysis is not informative, so for consistency with the

previous two studies an analysis was carried out comparing the proportions of specific regrets in decades 2 ( $M = .03$ ,  $SD = .09$ ) and 3 ( $M = .05$ ,  $SD = .13$ ), with the combined proportions of specific regrets in decades 4 -7 ( $M = .03$ ,  $SD = .09$ ). Neither decade 2 ( $Z = .38$ ,  $p > .05$ ,  $r = .06$ ) nor decade 3 ( $Z = 1.19$ ,  $p > .05$ ,  $r = .21$ ) on their own contained significantly higher proportions than the combined non-bump decades, but although decades 2 and 3 combined ( $M = .08$ ,  $SD = .16$ ) did contain higher proportions than the combined non-bump decades, the difference was non-significant after the Bonferroni correction  $Z = 2.07$ ,  $p > .05$ ,  $r = .31$ .

Planned comparisons of the general and specific regret proportions within the bump decades showed significantly higher proportions of general than specific regrets in decade 2,  $t(80) = 3.88$ ,  $p < .001$ ,  $r = .40$ , and also in decade 3,  $t(80) = 9.29$ ,  $p < .001$ ,  $r = .72$ . There were also significantly greater proportions of general than specific regrets in decade 4;  $t(80) = 10.03$ ,  $p < .001$ ,  $r = .74$ .

#### *Analysis of the overlap between regret type by agency*

Two independent judges coded the anticipated regrets that were attributed to action, “*Deciding on a particular career*” (21%); inaction, “*Not going to places they wanted to*” (62%); both action and inaction, “*Focussing on career instead of enjoying life*” (12%); and neither action nor inaction, “*Career path*” (5%).

Agreement was acceptable ( $Kappa = .73$ ) and differences were resolved through discussion. Proportions of specific/general actions/inactions were calculated as previously described and entered into a 2 (type: specific/general) by 2 (agency: action/inaction) ANOVA.

As would be expected from the significant single sample t-test reported earlier, there was a main effect of regret type,  $F(1, 80) = 224.80$ ,  $MSE = .03$ ,  $p <$

.001,  $\eta_p^2 = .74$ , and a main effect of agency,  $F(1, 80) = 65.99$ ,  $MSE = .05$ ,  $\eta_p^2 = .45$ ,  $p < .001$  such that inaction regrets ( $M = .62$ ,  $SD = .28$ ) significantly outnumbered action regrets ( $M = .21$ ,  $SD = .24$ );  $t(80) = 8.12$ ,  $p < .001$ ,  $r = .67$ . There was also a significant type by agency interaction,  $F(1, 80) = 96.32$ ,  $MSE = .05$ ,  $p < .001$ ,  $\eta_p^2 = .55$ . Planned contrasts of the means involved in the interactions showed that general regrets were significantly more likely to be attributed to inaction ( $M = .59$ ,  $SD = .29$ ) than to action ( $M = .14$ ,  $SD = .20$ );  $t(80) = 9.66$ ,  $p < .001$ ,  $r = .74$ . Although specific regrets were more likely to be due to action ( $M = .07$ ,  $SD = .13$ ) than to inaction ( $M = .04$ ,  $SD = .10$ ), the difference was not significant;  $t(80) = 1.59$ ,  $p > .05$ ,  $r = .18$ . As with the previous studies, there is a strong overlap between the two dimensions, though again the results for specific-action regrets are not clear.

### *Analysis of Content*

Coding for content was carried out by two judges, who reached acceptable agreement ( $\kappa = .77$ ). Differences were resolved through moderation by the researcher. The domains were ranked in descending order as follows; *Family*, “Regret the way they brought up their kids” (18%); *Relationships-general*, “Certain relationships that went wrong” (11%); *Intimate relationships*, “Breakdown of marriage” (11%); *Character*, “Keeping themselves closed and contained” (11%); *Education*, “Not taking advantage of opportunities at school” (10%); *Travel*, “Not going places they always wanted to go” (8%); *Self development*, “Not having fulfilled their life in the way they wanted” (7%), and *Career/Work*, “A wrong career choice” (6%).



### 3.4.3 *Summary of Study 4b*

The results of this study are very similar to those of Study 4a, in terms of the predominance of general regrets, the overlap between the specific-general and action-inaction distinctions, and in terms of the content and distribution of both types of regret. The experiences people expected a contemporary to regret in life were very similar to the experiences participants in Study 4a anticipated for themselves, although the descriptions are more generic.

The final study takes a slightly different approach from the previous three studies, which used entirely within-subjects designs in which participants both generated and dated the experiences they thought most likely to be a source of regret. This is only one of the methods used to abstract underlying schemas: another method is to provide participants with descriptions of life events and have them estimate when they think these events are most likely to occur in the lifespan of an average person. Neugarten et al. (1965) and also Berntsen and Rubin, (2004, Study 1) use this method to obtain normative estimates for age-appropriate behaviour.

The following study uses a type of triangulation similar to that used by Berntsen and Rubin (2004, Study 1) in that it involves two groups, one to generate life events and another to date them. The *generate* group provides descriptions of experiences they imagine an average person might regret in life and these descriptions are then transcribed and given to a second group, whose job it is to estimate when in the lifespan each of the experiences described is likely to occur. To introduce variance into the dating procedure five judges date each experience and so multiple estimates are available for comparison. This method of having different groups generate and judge experiences is used in other paradigms to gain estimates of perceived normality (Bar-Hillel & Neter, 1996; Ross, Green & House, 1977) and

is also found in some prototype approaches to emotion classification (Shaver, Schwartz, Kirson & O'Connor, 1987; Storm & Storm, 1984).

### **3.5 Study 4c: young adults predict the regrets of an average person**

#### *3.5.1 Method*

##### *Participants*

This study was carried out in two stages, using two groups recruited at different times. The first group generated descriptions of experiences a typical 70 year old might regret in life and then estimated when these experiences would occur, using the person's age at the time as the temporal index. These descriptions (but not the associated dates) were then given to the second group, who simply estimated when the experiences were most likely to occur by dating them to the nearest decade. The procedure for both stages of the study will be described before the two analyses are presented.

##### *Group 1 (generate/date)*

This group was recruited from a psychology class at Durham University. There were 73 students in the group, 64 females and 9 males. The group ranged in age from 18 to 22 years ( $M = 18$ ,  $SD = .8$ ).

##### *Design, Materials and Procedure*

Participants in Group 1 were given a simple two page questionnaire. The cover sheet was exactly the same as the one used in Study 4b, with the exception that they were told they would be asked to imagine what experiences a person was likely

to regret when looking back at their life from the age of 70 (as opposed to the eve of their 70<sup>th</sup> birthday). A separate sheet was provided with five numbered spaces for describing the regrettable experiences. Participants were given the following instructions:

*I would like you to think about the life that an average person of your age will have lived by the time they reach 70 years of age. Think of all their goals and expectations, all the choices they will have made, and all the experiences they wanted out of life. Imagine that person looking back across their whole life and how they might feel if things haven't worked out as planned. What things are they likely to regret? Please use the spaces provided to describe the things that this person is likely to regret.*

On the other side of the description sheet a numbered box was provided for each of the descriptions. Participants were instructed to consider each of the experiences they had described and to try and estimate when in the life of an average 70 year old the experience was likely to have occurred, by giving that person's age at the time of the experience. A space was then provided where participants completed the sentence, "*At the time of the regrettable experience the person would be... ..* years old. Because participants had difficulties assigning regrets to a specific age, analysis of this data will not be reported. Instead, the dates given by the second group of participants will be reported.

## *Group 2 (date only)*

### *Procedure*

The descriptions generated by the first group were transcribed by the researcher and divided into 13 batches, so that each batch contained between 21 – 29 regrets ( $M = 25$ ), which were presented in a tabular list. The number of regrets per batch was determined by what would fit onto one side of A4 paper as some descriptions contained only one line of text, while others contained two or three lines. A further 13 batches were created by inverting the order of the original lists. The resulting 26 lists (13 *Standard order* and 13 *Inverted order*) were then used in the second part of the study. The second ‘judge’ group comprised 65 participants, 51 females and 14 males. The majority (61) were recruited from a psychology class at Durham University’s Queen’s Campus, Stockton, and a further 4 participants were recruited on campus in order to ensure that each batch of descriptions received ratings from an equal number of judges. The extra 4 participants comprised two postgraduates, one computer technician, and an undergraduate. The age of the sample ranged from 19 – 43 years ( $M = 20$ ,  $SD = 3.3$ ), with only one participant above ‘bump age’ (i.e., older than 29 years). Participants were given a brief verbal introduction to the purpose of the study and assured that they were under no obligation to participate. After consenting to take part in the study participants received a two page questionnaire. The cover sheet was similar to the one used for the generate/date group, with the exception of one paragraph instructing participants that they would be presented with a list of experiences that a person is likely to regret when looking back at their life from the age of 70. They were told that their task was to estimate when in that person’s life those regrettable experiences were likely to have occurred.

On a separate sheet was a tabular list containing the transcribed descriptions of the experiences an average 70 year old was expected to regret. Above the table were the following instructions:

*Below is a list of experiences a person might regret in life. Your task is to try and estimate when in that person's life the regretted experience is most likely to have occurred (not the feeling of regret, which may have occurred later). Use the following decades as a guide and date the experiences by writing the appropriate number in the 'Decade' column.*

To clarify the dating procedure a line of decade bins was presented between the instructions and the top of the tabular list. The list and decade bins are presented below:

**Decades (age):**    **1** <sup>(1-9)</sup>    **2** <sup>(10-19)</sup>    **3** <sup>(20-29)</sup>    **4** <sup>(30-39)</sup>    **5** <sup>(40-49)</sup>    **6** <sup>(50-59)</sup>    **7** <sup>(60-70)</sup>

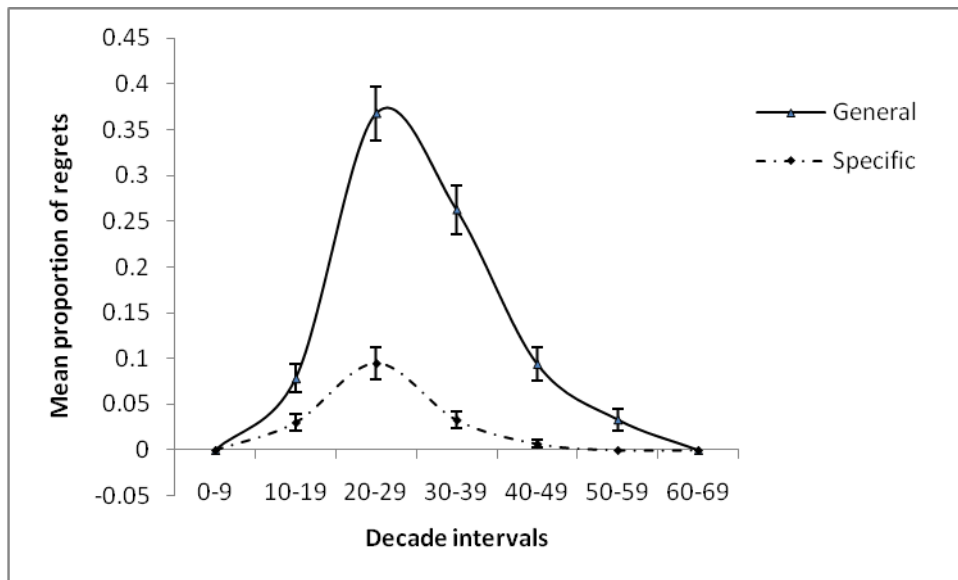
Regretted experience	Decade
"Not having children"	

### 3.5.2 Results

*Group 1 – Analysis of regret type.* In total Group 1 produced 304 regret descriptions, with each participant producing on average 4 descriptions. This average did not differ between sexes,  $t(71) = .30$ ,  $p > .05$ . The descriptions were coded along the specific-general dimension by two independent judges who reached acceptable agreement ( $\kappa = .70$ ). Differences were resolved by a third rater. The resulting category totals were 252 general and 52 specific regrets. A single sample

t-test using the mean proportion of general regrets ( $M = .84$ ,  $SD = .20$ ) showed that the number of general regrets was significantly higher than chance,  $t(72) = 14.27$ ,  $p < .001$ ,  $r = .86$ .

*Group 2 – Dating regrets.* Each batch of descriptions was rated by 5 judges from Group 2 (3 of whom rated the *standard order* lists and 2 of whom rated the *inverted order* lists), and a composite estimate was created for each regret description using the median decade from the 5 ratings. These estimates were used to calculate the mean proportion of specific and general regrets assigned to each of the 7 decades. The resulting distributions are presented in Figure 3.4.



**Figure 3.4 Study 4c: proportion of regrets predicted for an average person as a function of time in decade intervals for specific and general regrets. Error bars represent the standard error of the mean.**

### *Temporal distribution*

The distributions of the two types of regret shown in Figure 3.4 are consistent with the distributions in studies 4a and 4b. Three quarters of the specific regrets are clustered in the 2<sup>nd</sup> and 3<sup>rd</sup> decades, while the distribution of general regrets is more varied, with 53% located in the bump decades. Although the distribution of general regrets peaks in decade 3, the bump is once again skewed in favour of the 4<sup>th</sup> and 5<sup>th</sup> decades, which contain 43% of general regrets. As with the previous studies, the distributions of both types of regret were analysed separately, using a one-way repeated measures ANOVA for general regrets and the Friedman's non-parametric equivalent for specific regrets. Decades 1 and 7 were excluded from both analyses because these were the only two decades where neither type of regret was found, and for the analysis of the specific regret distribution decade 6 was also excluded for the same reason.

As would be expected from the distribution in Figure 3.4, the ANOVA for general regrets showed a significant effect of decade,  $F(2.7, 196.6) = 36.02$ ,  $MSE = .06$ ,  $p < .001$ ,  $\eta_p^2 = .33$ . Tukey HSD post hoc tests showed that this main effect was produced by decades 3 ( $M = .37$ ,  $SD = .25$ ) and 4 ( $M = .26$ ,  $SD = .24$ ), both of which contained significantly higher proportions than decades 2 ( $M = .08$ ,  $SD = .13$ ), 5 ( $M = .10$ ,  $SD = .15$ ) and 6 ( $M = .03$ ,  $SD = .11$ ; all  $p$ s  $< .001$ , all  $r$ s between .55 -.75). Although decade 3 contained higher proportions of general regrets than decade 4, this difference did not reach significance following correction,  $t(72) = 2.18$ ,  $p > .05$ ,  $r = .25$ .

Because no specific regrets were reported in decades 6 and 7, only the proportions in decades 2,3,4 and 5 were used in the Friedman's ANOVA, which showed a significant effect of decade,  $\chi^2(3) = 28.87$ . Bonferroni-corrected pairwise

comparisons showed this effect to be produced by decade 3 ( $M = .09$ ,  $SD = .15$ ) which contained significantly higher proportions of specific regrets than the combined proportions of decades 4 and 5 ( $M = .04$ ,  $SD = .09$ );  $Z = 2.47$ ,  $p < .01$ ,  $r = .38$ . The proportions of specific regrets in decade 2 ( $M = .03$ ,  $SD = .08$ ) did not differ significantly from the combined proportions in decades 4 and 5;  $Z = .56$ ,  $p > .05$ ,  $r = .08$ .

#### *Analysis of the overlap between regret type and agency*

Two independent judges coded the regrets as actions, “*Having a drunken one-night stand*” (68%); inactions, “*Not pursuing a relationship*” (20%); both action and inaction, “*Having/Not having children*” (11%); and neither action nor inaction, “*Regretting anything!*” (1%). Reliability was acceptable ( $Kappa = .76$ ) and differences were resolved through discussion. The proportions were calculated to determine how many of each participants regrets were specific actions, specific inactions, general actions, and general inactions, and these proportions were entered into a 2 (type: specific/general) by 2 (agency: action/inaction) ANOVA.

Unsurprisingly, there was a significant main effect of regret type,  $F(1, 72) = 190.30$ ,  $MSE = .03$ ,  $p < .001$ ,  $\eta_p^2 = .73$ . There was a main effect of agency,  $F(1, 72) = 64.88$ ,  $MSE = .06$ ,  $p < .001$ ,  $\eta_p^2 = .47$ , such that inaction regrets ( $M = .68$ ,  $SD = .30$ ) significantly outnumbered action ( $M = .20$ ,  $SD = .24$ ) regrets;  $t(72) = 8.05$ ,  $p < .001$ ,  $r = .69$ , and also a significant type by agency interaction,  $F(1, 72) = 62.55$ ,  $MSE = .06$ ,  $p < .001$ ,  $\eta_p^2 = .46$ . Planned contrasts of the means involved in the interactions showed that general regrets were significantly more likely to be attributed to inaction ( $M = .61$ ,  $SD = .30$ ) than to action ( $M = .13$ ,  $SD = .21$ );  $t(72) = 8.62$ ,  $p < .001$ ,  $r = .71$ . Specific regrets were equally as likely to be due to action ( $M$



= .07, SD = .13) as to inaction (M = .07, SD = .13);  $t(72) = .36, p > .05, r = .04$ . As with the previous study, there is a strong overlap between the two dimensions, though again the results for specific-action regrets are not clear.

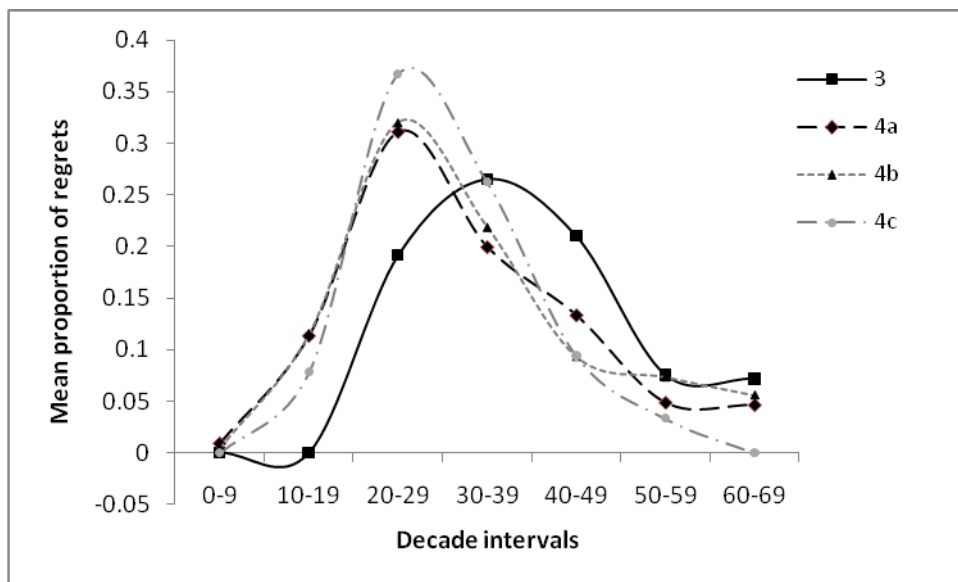
### *Analysis of content*

Two independent raters coded the regrets for content. Reliability was acceptable (Kappa = .70) and differences were resolved by the researcher. The main life domains were ranked in the following descending order: *Family*, “Never having had children” (16%); *Relationships-general*, “Failed relationships” (12%); *Work*, “Passing up a career opportunity” (12%); *Travel*, “Not having travelled more” (12%); *Intimate relationships*, “Not marrying the right person” (11%); *Education*, “Making the wrong choices in education” (6%); *Character*, “Not being brave enough to speak their mind.”(6%). Once again, the analysis of content reveals remarkable consistency between the studies of anticipated regrets.

### *3.5.3 Summary of Studies 3 – 4c*

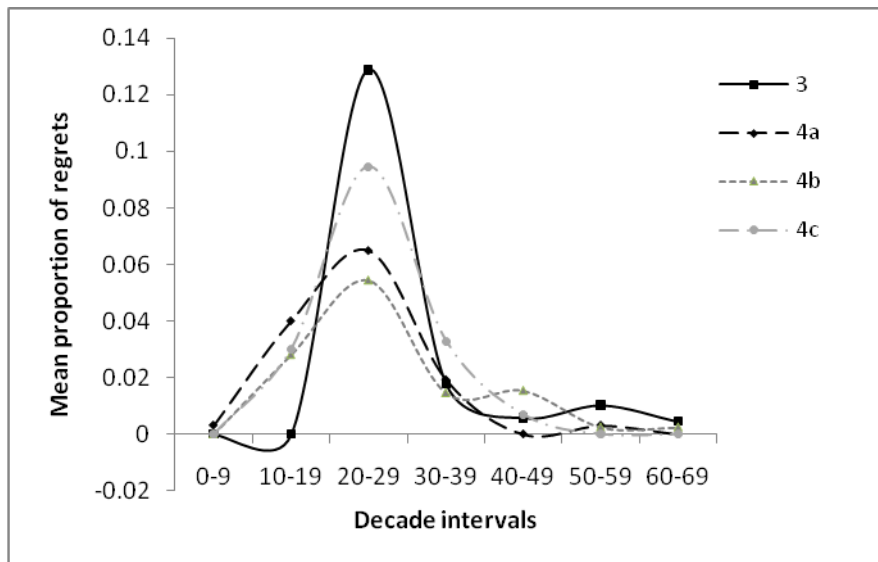
To sum up the findings of the 4 studies presented here, there was considerable overlap across studies in terms of the ranking of domains in which regrets were listed, whether experienced or imagined; the domains of family, intimate relationships, work, education, travel, character and self-development were consistently listed. Across all studies there were significantly more general than specific regrets and these were significantly more likely to be attributed to inaction than to action. Specific regrets were equally as likely to be attributed to action as to inaction.

The relative distribution of general and specific imagined regrets across the lifespan was consistent across studies 4a, 4b and 4c. General regrets produced a bump in decades 3 and 4, with the peak in decade 3. The exception to this profile was Study 3, where general regrets peaked in the 4<sup>th</sup> decade. For the purpose of comparison, the distributions of general regrets from all 4 studies are presented in Figure 3.5.



**Figure 3. 5     The distribution of anticipated general regrets for studies 3, 4a, 4b and 4c**

With regard to specific regrets, they were very few in number across all four studies and they were almost exclusively located in the near future, producing a bump spanning decades 2 to 4 and peaking in the 3<sup>rd</sup> decade. The distributions of specific regrets from the four studies can be seen together in Figure 3.6.



**Figure 3. 6 The distribution of anticipated specific regrets for studies 3, 4a, 4b and 4c**

### 3.6 Chapter discussion

The studies presented here have yielded four striking results. First, as predicted there was a ‘preminiscence bump’ in early adulthood for general anticipated regrets, which peaked in the third decade and which is consistent with a life script interpretation. Second there was considerable overlap in the content of the experiences described, which was consistent with that found in Studies 1 and 2 for older adults, as well as that reported by Roese and Summerville (2005). Third, the descriptions produced were overwhelmingly general in nature, and finally, participants overwhelmingly described anticipated regrets of inaction.

In terms of the temporal distribution of anticipated regrets, there was remarkable consistency across the studies, as can be seen in Figures 3.5 and 3.6. Overall, the bump for general anticipated regrets was similar to the distributions found in Studies 1 and 2 in that they peaked in the 3<sup>rd</sup> decade, although for anticipated regrets the distributions were skewed towards the 4<sup>th</sup> decade.

However, the studies also produced two unexpected findings: a bump for specific regrets and the temporal displacement of the bump itself. There are at least two possible explanations for both of these findings. The first interpretation draws on construal theory (Trope & Liberman, 2003), which was introduced in Chapter 1. This theory proposes that the mental representation of temporally near and temporally distant events differs in that temporally near events are construed in more detailed, concrete terms, whereas temporally distant events are construed in more abstract terms. As construal theory applies to future as well as to past events (Liberman & Trope, 1998; Liberman, Sagristano & Trope, 2003) it provides a good account of these two unexpected findings.

As far as the distribution of specific regrets is concerned, they were located almost exclusively in the near future (decades 2 and 3), with only 22% of all specific anticipated regrets located beyond the 3<sup>rd</sup> decade. This clustering of specific events in the near future is precisely what construal theory predicts and it is also consistent with the studies reviewed in the chapter introduction comparing past and future thought, which show that specific future events tend to be located in the near future (Berntsen & Jacobsen, 2008; Spreng & Levine, 2008). Although the life script does not locate specific regrets in a particular part of the lifespan, construal predicts that they would concern temporally near events, which in these studies happens to be the bump period, so while the distribution of specific regrets may appear at first glance to be problematic to the script-based hypotheses, it is not at all problematic in temporal construal terms.

Greater temporal extension is observed for general anticipated regrets, and in most cases more regrets were anticipated for the 4<sup>th</sup> and 5<sup>th</sup> decades than for the 2<sup>nd</sup> decade. The distribution of general anticipated regrets and the overall displacement

of the bump itself require a more complex interpretation than the one used for specific regrets, as it suggests that the life script and temporal construal are working in opposite directions.

On the one hand the life script locates the bump for general regrets in the 2<sup>nd</sup> and 3<sup>rd</sup> decades, whereas temporal construal locates general events in the very distant future. Since general anticipated regrets do not cluster in the most distant decades, it seems that the construal mechanism does not have as strong an influence on the distribution of anticipated general regrets as does the life script.

Of course it is also possible that the overall displacement of the bump may represent a genuine shift in the actual or perceived normative timetables.

Government statistics in the UK show for example that the average age at which women have their first child has risen by three years in as many decades, to 27.3 years. The average age at which men and women marry has also risen in the last three decades, from 25 and 23 years for men and women respectively in 1971, to 32 and 29 years in 2005/6 (Self & Zealy, 2007). These figures suggest that people are entering many of the normative roles later in life and such generational variation is widely reported (George, 1993). This interpretation of the shift in the bump is speculative, but certainly plausible and something that needs to be taken into account in future research on the bump phenomenon.

In terms of the content of anticipated regrets, young people appear to know what types of experiences are likely to be regretted in life, as the same domains emerged, with some variation, across all 4 studies. The rankings also reflected those reported for the experienced regrets of older adults in Studies 1 and 2, which strongly suggests that there is something resembling a norm for regret. But is this really surprising? At the level of the specific, idiosyncratic events that make up an

actual life there are probably countless possibilities for what can be regretted, but at the more general level observed here, what can be regretted in life becomes relatively limited.

This leads to the second striking finding of these studies, which is the consistently general nature of the descriptions produced. This is an important observation with quite broad implications. The studies of prospective thought by Newby-Clark and Ross (2003) and D'Argembeau and Van der Linden (2004) explicitly requested specific, episodic events, whereas participants in the present studies freely recalled whatever came to mind, and what came to mind tended to be general. As Conway (1992) has suggested, this level of representation is the most cognitively efficient and provides easiest access to the autobiographical memory knowledge base, and events at this level are brought to mind more easily during memory retrieval (Conway & Bekerian, 1987).

The observation that people consistently anticipated regrets associated with *not doing*, or inaction, has implications for regret research, as it lends considerable weight to the argument made in the previous chapter that inaction regrets are predominantly general in structure. That this pattern is found for imagined events also raises the possibility of a culturally scripted attitude to agency, such that inaction may be more negatively perceived. People confuse 'what might have been' with 'what ought to have been' (Miller & Turnbull, 1990) and it is quite probable that such reasoning extends to 'what ought to be'.

There is clearly a norm for what is worth regretting in life, as the evidence presented in this chapter suggests that the things older adults regret about the period of the reminiscence bump are similar in many ways to the regrets of those currently living through that period of life. More interestingly, those living in the bump know

what they and their contemporaries will regret, although they seem to see their regrettable experiences lying further down the road than may eventually turn out to be the case.

## Chapter 4: Regret and other emotions

### 4.0 Chapter overview

The studies in the two preceding chapters have been concerned with the distribution of specific and general regrets across the lifespan. The study reported in this chapter considers the affective profiles of different regret types, with the principal aim of applying the specific-general regret distinction to a distinction made by Gilovich, Medvec and Kahneman (1998) between “hot”, “wistful” and “despair-related” regrets. Gilovich et al. argue that action and inaction regrets evoke different emotions and that these associations may be mediated by temporal factors. In support of this claim they have shown that action regrets tend to be more recent and evoke hot emotions, whereas inaction regrets tend to be more distant and evoke wistful or despair emotions. The aim of Study 5 is to show that these patterns can be replicated for specific and general regrets. This prediction is based on the overlap established in studies 1-4c between the two distinctions, and also on the intuition that some emotions are simply more likely to be associated with specific than with general events. The present study extends Gilovich et al.’s distinctions by including a separate cluster of “moral” emotions with a view to exploring the relationship between regret, guilt, shame, and remorse.

A secondary aim of the study is to extend a distinction made by Berndsen, van der Pligt, Doosje and Manstead, (2004) between *intrapersonal* (self-focussed) and *interpersonal* (other-focussed) regrets, which they suggest represents a basis for distinguishing regret from guilt. It will be investigated whether a meaningful distinction can be made within intrapersonal regrets between those concerning achievement and those involving broader aspects of self-actualisation.



#### 4.1 Introduction: ‘varieties of regret’

As explained in Chapter 1, Gilovich and Medvec (1995) account for the temporal pattern of regret by viewing regret as a unitary emotion that changes over time. Psychological repair work makes regrettable actions short lived, whereas regrettable inactions fester over time due to an increased awareness of their consequences, reduced memory for obstructive antecedents, and memory biases favouring unfinished business. Kahneman (1995) accounts for regret’s temporal pattern by viewing short and long-term regrets as two distinct emotions which differ in affective ‘heat’. In his view action regrets typically concern “hot” responses to painful losses or embarrassing mistakes, which are usually short-lived and so concern relatively recent events, whereas inaction regrets for lost opportunities have a “wistful” quality due in part to the framing of questions in regret surveys, which participants interpret as an invitation to consider ways in which their lives could have been better. The resulting regrets represent elaborative counterfactuals that Kahneman describes as “pleasantly sad fantasies” (p 361).

Gilovich, et al. (1998) attempted to reconcile these positions in a series of three studies, the first of which had participants recall their ‘single biggest’ regrets of action and inaction from both the recent and distant past (defined as the “the past week” and the “entire life” respectively) and then select from a list of emotion terms those which corresponded to how they felt about their regrets. The emotion checklist contained seven *hot* (angry, ashamed, disgusted, embarrassed, frustrated, guilty and irritated), seven *wistful* (contemplative, nostalgic, sentimental, and wistful), and eleven unspecified *filler* emotions. Their results came down clearly in favour of Kahneman’s distinction: action regrets were more likely than inaction regrets to be

hot, regardless of whether they were distant or recent, while inaction regrets were more likely than action regrets to be wistful, particularly if they concerned distant events.

In a second study Gilovich et al. extended their hot/wistful distinction by including a cluster of *despair* emotions (empty, helpless, longing, sad and unfulfilled) to test the claim that some distant regrets might be more than just “pleasantly sad fantasies” and might instead have an unpleasantly sad or despairing quality. Participants were asked to say which of the listed emotions they associated with the biggest regret of action or inaction from their entire lives. The results confirmed that inaction regrets were more likely than action regrets to involve despair as well as wistful emotions, although the results for hot emotions were ambiguous, as hot emotions were endorsed for action and inaction regrets with equal frequency. A third study gave participants the option of saying that neither their life’s biggest action nor inaction regret was more strongly associated with the target emotions, and again inaction regrets tended to be associated with both wistful and despair emotions while action regrets tended to be more strongly associated with hot emotions. Overall the authors’ respective claims were partially reconciled, but they acknowledged that the studies provided only indirect evidence for the factors assumed by Gilovich and Medvec (1995) to underlie regret’s temporal profile. Indeed, only their first study includes a temporal manipulation between recent (past week) and distant (entire lifetime) regrets: the other two studies use only regrets from the entire lifetime and assume them to be synonymous with distant regrets. As this assumption is not tested Gilovich et al. place the emphasis of their discussion on the systematic patterns of emotions evoked by different types of regret and this emphasis is adopted for the present study. Although temporal factors are assumed

to be involved in mediating these patterns, the nature and extent of that involvement is not of central concern.

Matching discrete emotions with different types of regret is a somewhat intuitive process, but some associations seem more plausible than others. For example, terms such as contemplative, nostalgic, sentimental, or wistful seem more likely to bring to mind general rather than specific experiences. Similarly, emotion terms such as empty, helpless, longing, sad and unfulfilled are associated with more general moods or a general sense of absence (Storm & Storm, 1987) and so might be expected to be associated with general rather than specific experiences. The hot emotion term *angry* was more likely to elicit specific than general memories when used as a cue word (Williams & Broadbent, 1996) and something similar might be expected for such terms as disgusted, embarrassed, frustrated and irritated, which seem more likely to refer to discrete events than to summarised or extended events.

#### *4.1.1 Comparing intrapersonal and interpersonal regrets*

Berndsen, van der Pligt, Doosje and Manstead, (2004) have recently attempted to distinguish regret from guilt on the basis that regret is associated with failures of self-actualisation, broadly defined as “*intrapersonal harm*” (emphasis added), whereas experiences involving “*interpersonal harm*” are best described as involving guilt. The authors support this distinction in two scenario studies where varying degrees of intrapersonal or interpersonal harm are depicted. Participants are required to indicate how much regret or guilt they would experience in each of the situations described. Scenarios depicting high intrapersonal harm elicited more regret than guilt, whereas scenarios depicting high interpersonal harm elicited more

guilt (Study 1), and increases in the negative consequences for the other person was also associated with increased guilt but not regret (Study 2).

A shortcoming of this self-other distinction for regret and guilt is that it fails to discriminate between types of experience within these dichotomous categories, particularly in its restricted application of the term *self-actualisation* to self-focussed experiences. Maslow (1968;1970) originally intended the term to include all experiences that optimise personal potential, whether self-focussed or not, and he distinguished between motivations that serve to satisfy biological, material or social needs (such as hunger, financial security or respect from others) and “growth” needs focussing on the development of personal potential through the expression of love to other people. Moral philosophers see behaviour towards others as a means of self-actualisation, particularly through the acknowledgement of guilt and the expression of remorse for harm done (see Gaita, 1991, 2004). Regret is also engendered by failures to fulfill some inner obligation, either to oneself or to some higher purpose: the archaic notion of *accidie*, (spiritual torpor) was once considered a sinful experience (Harré & Finlay-Jones, 1986). At the same time, Keltner and Buswell (1996) found that common antecedents of guilt were failure of duties (not studying hard enough) or breaching personal or moral codes (lying to parents, cheating on exams). Such experiences may involve the judgement of others, but they do not qualify as instances of interpersonal harm in the sense intended by Berndsen et al. In short, it is possible to harm one’s own potential in ways that are not self-focussed, just as it is also possible to feel self-focussed guilt. One of the purposes of the present study is to clarify this distinction and show that some self-actualisation regrets are other-focussed and that some guilt experiences are self-focussed.

#### 4.1.2 The emotion clusters used in Study 5

The clusters used in the present study comprise 3 to 4 items. The “hot”, “wistful” and “despair” clusters are derived as closely as possible from items used by Gilovich et al. and they include *angry, disgusted, embarrassed, and irritated* (“hot”); *wistful, nostalgic, contemplative* and *sentimental* (“wistful”); and *empty, sad, unfulfilled* and *helpless* (“despair”). The “filler” items are *bored, confused, disillusioned* and *resentful*. Gilovich et al. do not specify their filler emotions and the filler items used in the present study are drawn from various taxonomies (Fehr & Russel, 1984; Shaver et al., 1987; Storm & Storm, 1987) on the basis that they represent plausible associate terms that might ‘fit in’ well enough act as fillers, but not ‘stand out’ so much that they become targets themselves.

The cluster of “moral” emotion items comprises *guilty, ashamed* and *remorseful*. Gilovich et al. describe regret as “one of the other” moral emotions alongside guilt and shame, but as was discussed in Chapter 1, regret’s status as a discrete emotion distinguishable from guilt, shame or remorse is a contested issue (Sabini & Silver, 2005), and one that is only partly addressed in this thesis. However, since many taxonomical studies group regret together with the moral emotions (Shaver et al., 1987; Storm & Storm, 1987) it makes sense to consider them as a distinct cluster and to consider their relationship with regret in isolation from other emotions. Although shame varies in affective ‘temperature’ (Lazarus, 1991) and can be associated with both hot and despair emotions, it is primarily regarded as a moral emotion and so is treated as such here.

### *Overview of Study 5 and main predictions*

The purpose of the present study is to use the specific-general distinction to replicate Gilovich et al.'s findings, and so the following directional predictions are made: (1) specific regrets will be more likely than general regrets to be hot; (2) general regrets will be more likely than specific regrets to be wistful; and (3) general regrets will be more likely than specific regrets to be despair-related. Gilovich et al. do not include a separate category of moral emotions, but they designate guilt and shame as hot emotions, thereby implicating them by association with specific more than with general regrets. Remorse is also expected to be more strongly associated with specific regrets on the basis of characteristics described in Chapter 1. Remorse is an acknowledgement of harm done to another, (Proeve & Howells, 2006) and usually (but not always) involves behaviours we know all along to be wrong and doesn't come from a sudden insight following reflection on distant events (Wierzbicka, 1999). While it is feasible to think remorse might be felt for summarised events (e.g. mistreating someone over many years), it is more likely that remorseful memories will mostly concern specific episodes. Finally, although remorse may be experienced following a specific failure to take action, it is most likely to involve action. It is expected therefore that the ratings in the moral cluster will be significantly higher for specific than for general regrets.

The present study does not include a temporal manipulation, as temporal patterns are not the primary concern of the study and were not directly tested by Gilovich et al. Also, the manipulations used by Gilovich et al. make unwarranted assumptions which have neither empirical nor theoretical bases. They assume for example that the biggest regret of one's entire life and the biggest regret from the past week are mutually exclusive categories, which they are not. They also assume

that regrets from the entire lifetime are synonymous with distant regrets, which is clearly not the case. No such assumptions are made in the present study and no hypotheses involving temporal factors are advanced or tested. Instead the focus is on the different emotions evoked by different types of regret.

The main prediction regarding the intrapersonal and interpersonal distinctions is that within intrapersonal regrets two clear categories will emerge, one to do with regrets of achievement and another concerning broader aspects of self-actualisation, which will include character regrets and regrets concerning self-implicating behaviour with others. In this sense, self-actualisation regrets and other-focussed regrets are expected to share many characteristics in that they are both more likely than self-achievement regrets to evoke moral emotions such as guilt, shame and remorse.

## **4.2 Study 5: examining the affective profiles of specific and general self- and other-focussed regrets.**

### *4.2.1 Method*

#### *Participants*

Participants were recruited from various locations in the Durham and Teesside regions. The sample comprised undergraduate and postgraduate students from Durham University's Queen's Campus (many of whom took questionnaires home to be distributed amongst friends and family), and a large proportion of the questionnaires were distributed to local branches of University of the Third Age, which is a self-governing organisation for retired people wishing to pursue educational and other self-development activities. Along with these groups were

members of the wider community recruited through word of mouth and personal contacts. Participants ranged in age from 18 to 82 years and the average age was 48.6 years ( $SD = 19.3$ ). Approximately 400 questionnaires were distributed and 87 usable questionnaires were returned.

### *Design, Materials and Procedure*

A postal survey was conducted in which two separate groups of respondents were asked to provide either a specific or a general autobiographical regret and then answer some questions about that experience. Respondents received a stamped, self-addressed envelope containing a two-page questionnaire and a cover letter, both of which are presented in full in Appendix A. The cover letter informed respondents that the study was part of a PhD in Psychology looking at the emotion of regret and the way it is remembered, and that it involved a simple questionnaire about regret, which was totally anonymous and confidential. The cover letter also gave the researcher's full contact details should respondents have any queries concerning the survey. A separate cover sheet outlined the purpose of the study and gave some information of the task involved:

*This study is concerned with how people think and feel about the experience of regret. Regret is the emotion we experience when we think about things that didn't turn out as we wanted them to. It may be experienced in a variety of ways and may concern a wide range of experiences. Regret may focus on a single moment in the past, or may concern something spanning days or decades. Your participation is entirely voluntary and you are free to withdraw at any point.*



*Should you choose to participate you will be asked to describe something that you regret and then answer questions related to that regret.*

*Your responses will be anonymous and your age, sex and level of education are the only personal identity details you provide, and no-one will be able to link these to the experience(s) you describe.*

Spaces were provided for demographic information and a box was ticked to indicate consent. On a separate page of the questionnaire participants received instructions to think of a regret, which was followed by some questions about the regretted experience. Instructions on the *specific* questionnaire asked participants to think of “*something that you regret which concerns a specific episode that took place within the course of a single day.*” Instructions on the *general* questionnaire asked for “*something general, something spanning any period longer than a single day.*” In both cases participants were told that the experience could come from any period of their lives and concern anything they had done (or failed to do), anything they had said (or failed to say), any choices, decisions, or missed opportunities they wished had turned out differently. A space was provided in which the participant then described in one sentence their regretted experience. Following these instructions were three questions about the characteristics of the regret. For both types of regret, the first question asked participants to say whether the regret was due to something they had done (action), something they didn’t do (inaction), both, or neither. The second and third questions concerned temporal characteristics of the regretted experience.

For specific regrets, participants were asked to indicate which part of their lives the regret came from by indicating how old they were at the time of the experience. The third question then asked them to indicate their age at the time they had become conscious of the experience as something they regretted.

For general regrets, the second question was the same, except that it included the provision for dating experiences spanning more than one year, in which case participants estimated how old they were when they first had the opportunity to avoid the regret. The third question for general regrets was the same as that for specific regrets.

The remainder of the questionnaire comprised an emotion checklist presented on a separate sheet in the form of a grid box with the 19 emotions terms listed in random order in a column on the left. Above the checklist were instructions. Participants were told that the researcher was interested in how they felt whenever they thought about their regret. They were told to consider the list of adjectives describing emotional states and to consider how much each one applied to their feelings when recalling the regret they had described. Inside the box containing the checklist, participants were instructed to indicate, by ticking the relevant column, how much their regret made them feel each of the emotion terms listed. They provided ratings on a scale anchored at 1(not at all) to 5 (a lot).

#### *4.2.2 Results*

Of the 87 useable questionnaires that were returned, 42 (48%) were specific and 45 (52%) were general. A preliminary reading by the researcher revealed that the vast majority (91%) of the regret descriptions provided were consistent with the type specified in the questionnaire, and so no recategorisation was necessary, as was the

case with Study 2. There was no significant difference between the numbers of regrets of each type;  $\chi^2(1) = .10, p > .05$ .

### *Data coding*

A pair of independent judges coded the content of the regrets along two separate dimensions. Regrets were first categorised according to life domains, as with all previous studies in the thesis, and then subsequently the same regrets were categorised according to the self-other focus of harm as laid out by Berndsen et al. (2005). However, whereas Berndsen et al. treat this latter distinction as a simple dichotomy, the present study makes a distinction within self-focussed regrets between those that are concerned with achievement and those that are not. Whilst acknowledging that all human endeavours are to some degree associated with the achievement of goals, achievement in the present study is operationalised as relating to attainment in the domains of education, career, sport, hobbies and so on. Self-focussed regrets not concerned with achievement are those involving experiences associated with obstructed or unfulfilled personal potential in other domains. For ease of expression and understanding, these two types are referred to as *self-achievement* and *self-actualisation* regrets respectively, bearing in mind the qualified use of this latter term previously mentioned. *Interpersonal* regrets are operationalised as those involving real or perceived harm done to others, or good withheld from others. Such regrets are referred to simply as *other-focussed*, and are distinct from regrets for the misfortunes of others which carry no implication of responsibility on the part of the person regretting. Inter-rater reliability for both sets of coding was acceptable, with kappas of .76 and .74 for content and self/other coding respectively. Differences were resolved through discussion with the

researcher. In a subsequent section the results of this coding will be presented in the analysis of regret content, along with some descriptive examples.

An average was calculated for each participant's combined cluster ratings. This measure, which is used in some of the analyses to be reported, is defined by Wrosch and Heckhausen (2002) as a measure of regret intensity, and as a measure of overall negative affect by Wrosch, et al. (2005), but is used here simply as an overall measure of regret.

#### *Analysis of the overlap between regret type and agency*

Because the predictions of the study are predicated on an overlap between the two dimensions, the first analysis compared the frequencies of specific and general regrets that were due to action and inaction.

Overall, of the 87 regrets produced 27 were attributed to action, "*Starting to smoke*"; 33 to inaction; "*An action I did not take at the time*", 24 to both an action and an inaction; "*Not attending school and wasting time*", and 3 to neither an action nor an inaction; "*Told I was no longer required by the company*". An analysis of the frequencies of specific actions (13), specific inactions (18), general actions (14) and general inactions (15) revealed that this study does not replicate the overlap between regret type and agency observed in studies 1-4c:  $\chi^2(1) = .24, p = .79$ .

#### *Relationships within the clusters: reliability analysis*

A reliability analysis was carried out to assess the suitability of items and the constructs assumed to underlie the clusters. Cronbach's (1951) alpha coefficient is used as the index of reliability: it is derived from inter-item correlations and the strength of the correlations between individual items and the scale as a whole. Kline

(2000) suggests that for a 5-point response scale such as the one used in the present study, Pearson correlations are the most appropriate index of reliability, and he suggests item-total correlations of .5 or above as indicators of item suitability. He also suggests that in order to ensure enough variance in the correlation matrix there should be at least twice the number of participants to items, a criterion met in the present study. Table 4.1 shows the reliability coefficients for each cluster, the item-total correlations, and the alpha coefficient that would result from removal of an item. As can be seen all alphas are above .70, which Kline regards as the lower bound of scale reliability.

The items in the *Moral* cluster all have coefficients above 0.5 and so correlate strongly with the scale total. *Ashamed* is the strongest item, while *remorseful* appears to be the weakest. Overall, the scale would not be improved by removal of any item. The *Hot* cluster has the lowest alpha of all the critical clusters and there is less variation between individual items. The item *embarrassed* correlates with the scale below 0.5 and is the weakest item in this cluster. However, removing this or any other item from the scale would not improve reliability. The *Wistful* cluster has a high alpha and all items correlate strongly with the scale overall. *Sentimental* is the strongest item in the cluster and *wistful* is the weakest, which is on the border of Kline's (2000) inclusion criterion. The despair cluster has a relatively low alpha and has the most varied items. While *empty* and *helpless* are strongly correlated with the scale, *unfulfilled* and *sad* have correlations below 0.5, and *sad* is the only item from the four clusters whose removal would improve the overall reliability of the cluster.

**Table 4.1 Reliability statistics for all emotion clusters, with alphas ( $\alpha$ ) and Pearson correlations**

<i>Cluster and Alpha (<math>\alpha</math>)</i>	<i>Item-total correlation</i>	<i><math>\alpha</math> if item deleted</i>
<b>Moral (<math>\alpha = .77</math>)</b>		
<i>Guilty</i>	.60	.70
<i>Ashamed</i>	.64	.65
<i>Remorseful</i>	.58	.73
<b>Hot (<math>\alpha = .71</math>)</b>		
<i>Angry</i>	.52	.63
<i>Disgusted</i>	.51	.64
<i>Embarrassed</i>	.45	.67
<i>Irritated</i>	.52	.63
<b>Wistful (<math>\alpha = .77</math>)</b>		
<i>Wistful</i>	.50	.75
<i>Contemplative</i>	.54	.73
<i>Sentimental</i>	.66	.66
<i>Nostalgic</i>	.59	.70
<b>Despair (<math>\alpha = .73</math>)</b>		
<i>Empty</i>	.60	.62
<i>Helpless</i>	.61	.60
<i>Sad</i>	.37	.74
<i>Unfulfilled</i>	.49	.68

In the normal course of scale construction scale reliability is improved through an iterative process involving the removal or replacement of items and the

manipulation of the underlying factor structures. The revised scale is then tested on a different sample and this process is repeated until eventually a refined and reliable measure is produced. As the present study stands alone, items cannot be removed, but overall the psychometric properties of the clusters appear to be acceptable for the present purposes.

#### *Relationships between the clusters*

Table 4.2 shows the zero-order correlations between the emotion clusters. As can be seen, the associations between the critical variables are consistent with the predictions of the study. For example, the *Moral* and *Hot* emotions are strongly associated and both are statistically independent from the *Wistful* cluster, and there is a small negative correlation between the *Hot* and *Wistful* emotions. Also, there is a strong association between the *Wistful* and *Despair* clusters. The *Despair* emotions appear to share characteristics of both the *Moral* and *Wistful* clusters, but they are not correlated at all with the *Hot* emotions. These patterns suggest clear distinctions between emotions along a dimension of ‘heat’ and on the whole the four critical emotion clusters appear to represent distinct affective constructs.

**Table 4.2      Zero-order correlations between all emotion clusters**

	<i>Moral</i>	<i>Hot</i>	<i>Wistful</i>
<i>Moral</i>			
<i>Hot</i>	.48**		
<i>Wistful</i>	.03	-.12	
<i>Despair</i>	.29**	.01	.35**

\*\* Correlation significant at the 0.01 level (2-tailed)

*Main analysis: regret type, emotion cluster and regret focus.*

To test the directional hypotheses that specific and general regrets are differentially associated with different emotion clusters, and that regret focus differs between emotion clusters, the composite means for each cluster were entered into a 2 (regret type: specific/general) by 4 (cluster: moral, hot, wistful, despair) by 3 (regret focus: self-achievement; self-actualisation; other-focussed) mixed model ANOVA. Table 4.3 shows the descriptive statistics for this analysis. The analysis revealed no main effect of regret type,  $F(1,76) = .15$ ,  $p > .05$ , but there was a significant main effect of cluster,  $F(2.6, 195.1) = 4.63$ ,  $MSE = .92$ ,  $p < .005$ ,  $\eta_p^2 = .06$  and a significant main effect of regret focus;  $F(2, 76) = 4.12$ ,  $MSE = 8.28$ ,  $p < .05$ ,  $\eta_p^2 = .09$ . The two way interaction between regret type and emotion cluster was also significant,  $F(2.6, 195.1) = 5.74$ ,  $MSE = .92$ ,  $p < .003$ ,  $\eta_p^2 = .07$ , as was the two way interaction between regret focus and emotion cluster;  $F(5.1, 195.1) = 3.36$ ,  $MSE = 5.13$ ,  $p < .01$ ,  $\eta_p^2 = .08$ . There was no significant two way interaction between regret type and focus,  $F(2,76) = 1.55$ ,  $p > .05$ ,  $\eta_p^2 = .04$ , and no significant three way interaction between regret type, regret focus, and emotion cluster;  $F(2.6, 195.1) = .50$ ,  $p > .05$ ,  $\eta_p^2 = .01$ .

As the main effect of emotion cluster was unexpected and no predictions were made in this regard, Tukey HSD post hoc comparisons were carried out to examine the between-cluster differences. The cluster means can be seen in Table 4.3. Overall, the *Moral* cluster received higher ratings than the other three clusters, but only the differences between it and the *Hot*,  $t(81) = 5.23$ ,  $p < .01$ ,  $r = .50$  and *Wistful*,  $t(81) = 3.05$ ,  $p < .01$ ,  $r = .32$  clusters were significant. Ratings for the *Despair* cluster were significantly higher than the ratings for the *Hot*,  $t(81) = 3.26$ ,  $p$



<.01,  $r = .34$ ) and *Wistful*,  $t(81) = 2.37$ ,  $p < .05$ ,  $r = .28$  clusters. There were no other significant between cluster differences.

**Table 4.3** Summary statistics for the 2 (type) by 4(cluster) by 3 (focus) ANOVA, with number of observations ( $n$ ), means, and standard deviations.

		Moral		Hot		Wistful		Despair		<i>Focus**</i>	
<b>Specific</b>	<i>n</i>	<b>M</b>	<i>SD</i>	<b>M</b>	<i>SD</i>	<b>M</b>	<i>SD</i>	<b>M</b>	<i>SD</i>	<b>M</b>	<i>SD</i>
S/ach*	5	2.00	0.85	2.45	1.12	2.05	0.94	2.30	1.11	2.20	0.66
S/act	16	2.81	1.15	2.64	0.79	1.83	0.74	2.44	1.12	2.43	0.66
Other	20	3.65	1.22	2.24	1.15	2.08	1.12	2.68	1.10	2.66	0.72
<i>Cluster (specific)</i>		3.12	1.27	2.42	1.01	1.98	0.95	2.54	1.09	2.51	0.69
<b>General</b>											
S/ach	12	1.44	0.80	1.56	0.53	2.04	0.88	2.13	0.60	1.79	0.53
S/act	16	3.06	1.19	2.28	1.13	2.88	1.17	2.81	1.24	2.76	0.87
Other	13	2.87	1.10	1.67	0.66	2.71	1.15	2.88	1.22	2.54	0.69
<i>Cluster (general)</i>		2.53	1.26	1.88	0.89	2.58	1.12	2.63	1.11	2.40	0.82
<b>Cluster overall</b>		2.83	1.29	2.15	0.99	2.28	1.07	2.59	1.09	2.46	0.75

\*S/ach = self achievement and S/act = self actualisation \*\* Marginal focus means

Tukey HSD pairwise comparisons of the means in the main effect of regret focus showed that the overall regret ratings for self-actualisation regrets ( $M = 2.59$ ,  $SD = .77$ ) were significantly higher than those for self-achievement regrets ( $M = 1.91$ ,  $SD = .58$ );  $t(47) = 3.17$ ,  $p < .01$ ,  $r = .42$ . Other-focussed regrets ( $M = 2.61$ ,  $SD = .70$ ) also had higher ratings overall than did self-achievement regrets;  $t(48) = 3.52$ ,

$p < .01$ ,  $r = .45$ . Regret ratings for self-actualisation regrets did not differ significantly from other-focussed regrets;  $t(63) = .09$ ,  $p > .05$ ,  $r = .01$ .

Planned comparisons on the means involved in the significant interaction between regret type and emotion cluster showed that as predicted, *Moral* emotions were significantly more likely to be evoked by specific than by general regrets;  $t(80) = 2.13$ ,  $p < .05$ ,  $r = .23$  as were *Hot* emotions;  $t(80) = 2.58$ ,  $p < .05$ ,  $r = .28$ . Also in line with the predictions was the finding that *Wistful* emotions were significantly more likely to be attributed to general than to specific regrets;  $t(80) = 2.64$ ,  $p < .05$ ,  $r = .28$ . Ratings for the *Despair* emotions did not differ significantly between general and specific regrets;  $t(80) = .40$ ,  $p > .05$ ,  $r = .04$ .

Tukey HSD post hoc comparisons of the means involved in the interaction between regret focus and emotion cluster revealed only one significant difference, which was in the moral cluster: self-actualisation regrets ( $M = 2.94$ ,  $SD = 1.16$ ) were significantly more likely than self-achievement regrets ( $M = 1.61$ ,  $SD = 0.83$ ) to evoke the moral emotions;  $t(47) = 4.12$ ,  $p < .01$ ,  $r = .51$ . Similarly, other-focussed regrets ( $M = 3.34$ ,  $SD = 1.22$ ) were also significantly more likely than self-achievement regrets to evoke the moral emotions;  $t(48) = 5.27$ ,  $p < .01$ ,  $r = .60$ . Although ratings on the moral emotions were higher on average for other-focussed than for self-actualisation regrets, the difference did not reach significance;  $t(63) = 1.37$ ,  $p > .05$ ,  $r = .17$ .

#### *Analysis of agency, regret focus and emotion cluster*

To test whether the patterns observed by Gilovich et al. would be found using the clusters in the present study, the previous analysis was repeated using agency as the between-subjects variable, with only action and inaction regrets included. For

consistency with the main analysis regret focus is also included. The summary statistics involved in the 2 (agency: action, inaction) by 4 (emotion cluster: moral, hot, wistful, despair) by 3 (focus: self-achievement, self-actualisation, other-focused) mixed model ANOVA are presented in Table 4.4.

**Table 4.4 Summary statistics for the 2 (agency) by 4(cluster) by 3 (focus) ANOVA, number of observations (*n*), means and standard deviations.**

		<b>Moral</b>		<b>Hot</b>		<b>Wistful</b>		<b>Despair</b>		<b>Focus**</b>	
<b>Action</b>	<b>n</b>	<b>M</b>	<b>SD</b>	<b>M</b>	<b>SD</b>	<b>M</b>	<b>SD</b>	<b>M</b>	<b>SD</b>	<b>M</b>	<b>SD</b>
S/ach*	5	<b>1.73</b>	<i>1.01</i>	<b>2.10</b>	<i>0.98</i>	<b>2.20</b>	<i>0.84</i>	<b>1.95</b>	<i>0.60</i>	<b>2.00</b>	<i>0.70</i>
S/act	10	<b>3.33</b>	<i>1.38</i>	<b>2.95</b>	<i>1.25</i>	<b>2.05</b>	<i>1.17</i>	<b>2.65</b>	<i>1.22</i>	<b>2.75</b>	<i>0.90</i>
Other	10	<b>3.60</b>	<i>1.44</i>	<b>2.58</b>	<i>1.24</i>	<b>1.93</b>	<i>0.88</i>	<b>2.18</b>	<i>0.76</i>	<b>2.57</b>	<i>0.66</i>
<b>Cluster (action)</b>	<b>25</b>	<b>3.12</b>	<i>1.47</i>	<b>2.63</b>	<i>1.19</i>	<b>2.03</b>	<i>0.96</i>	<b>2.32</b>	<i>0.96</i>	<b>2.53</b>	<i>0.79</i>
<b>Inaction</b>											
S/ach	5	<b>2.00</b>	<i>1.03</i>	<b>1.80</b>	<i>1.03</i>	<b>2.20</b>	<i>0.99</i>	<b>2.15</b>	<i>0.84</i>	<b>2.04</b>	<i>0.77</i>
S/act	15	<b>2.62</b>	<i>1.08</i>	<b>2.02</b>	<i>0.69</i>	<b>2.53</b>	<i>1.11</i>	<b>2.48</b>	<i>1.01</i>	<b>2.42</b>	<i>0.62</i>
Other	12	<b>3.08</b>	<i>1.29</i>	<b>1.94</b>	<i>0.92</i>	<b>2.75</b>	<i>1.37</i>	<b>3.31</b>	<i>1.26</i>	<b>2.77</b>	<i>0.80</i>
<b>Cluster (inaction)</b>	<b>32</b>	<b>2.70</b>	<i>1.18</i>	<b>1.95</b>	<i>0.76</i>	<b>2.56</b>	<i>1.18</i>	<b>2.74</b>	<i>1.15</i>	<b>2.49</b>	<i>0.74</i>
<b>Cluster overall</b>	<b>57</b>	<b>2.88</b>	<i>1.32</i>	<b>2.25</b>	<i>1.02</i>	<b>2.33</b>	<i>1.11</i>	<b>2.56</b>	<i>1.08</i>	<b>2.51</b>	<i>0.76</i>

\*S/ach = self achievement and S/act = self actualisation \*\* Marginal focus means

The analysis produced no main effect of agency,  $F(1, 51) = .02$ ,  $p = .89$ , so the mean ratings overall were not greater for either action or inaction regrets. There was a significant main effect of emotion cluster,  $F(2.4, 121.9) = 2.78$ ,  $MSE = 2.64$ ,

$p < .05$ ,  $\eta_p^2 = .09$ , and a marginally significant main effect of regret focus,  $F(2, 51) = 2.83$ ,  $MSE = 2.20$ ,  $p = .07$ ,  $\eta_p^2 = .10$ .

There was also a significant two way interaction between agency and cluster,  $F(2.4, 121.6) = 3.77$ ,  $MSE = 2.64$ ,  $p < .05$ ,  $\eta_p^2 = .07$ , but no interaction between agency and focus  $F(2, 51) = .77$ ,  $p > .05$ , no two way interaction between focus and cluster,  $F(2.4, 121.6) = 1.54$ ,  $p > .05$ , and no three way interaction between agency, emotion cluster, and focus  $F(4.7, 121.6) = .99$ ,  $p > .05$ .

Tukey HSD post hoc tests on the means in the significant main effect of cluster showed that although the *Moral* cluster was more strongly endorsed than any other cluster, it differed significantly only from the *Hot* cluster;  $t(56) = 4.30$ ,  $p < .01$ ,  $r = .49$ . Post hoc tests on the marginal effect of focus showed only one significant difference, between other-focussed regrets and self-achievement regrets;  $t(30) = 2.47$ ,  $p = .05$ ,  $r = .41$ .

Planned comparisons of the interaction between agency and emotion cluster show that the interaction is driven mostly by differences in the *Hot* cluster which is significantly more likely to be endorsed for action than for inaction regrets;  $t(38.6) = 2.47$ ,  $p < .05$ ,  $r = .37$ . There is a marginally significant difference within the *Wistful* emotions, which are more likely to be associated with inaction than action regrets;  $t(55) = 1.83$ ,  $p = .07$ ,  $r = .24$ . These patterns are consistent with those found by Gilovich et al., although the associations here are considerably weaker.

To summarise thus far; regret overall seems to be most strongly associated with the moral and despair emotions. Specific regrets are more likely to evoke moral and hot emotions, while general regrets are more likely to evoke wistful emotions. Neither type of regret is more strongly associated with despair emotions. Not all of the patterns found for specificity also extend to agency.

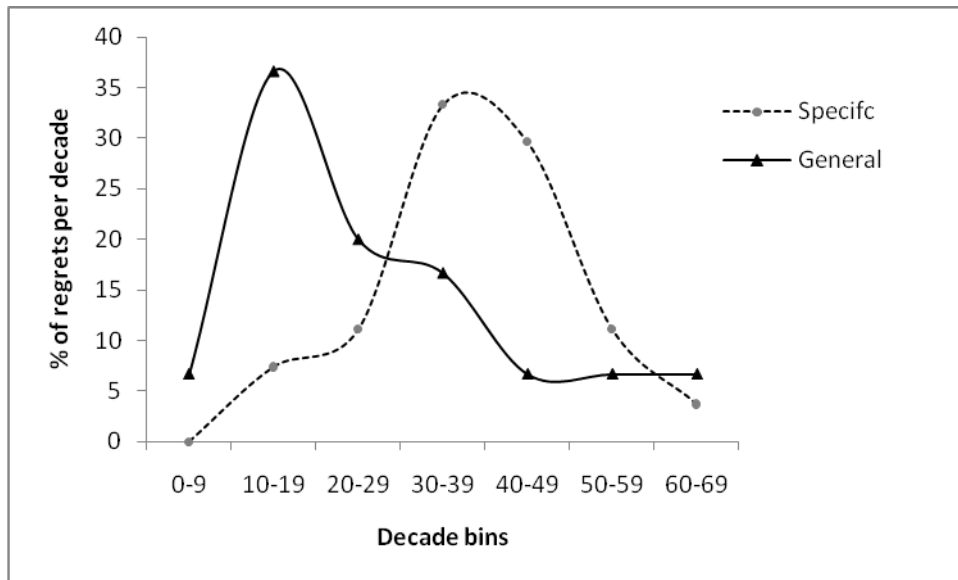
### *Temporal factors*

Although no temporal manipulation was included in this study some temporal patterns were derived post hoc for the purpose of comparison with previous studies in this thesis and because they have a bearing on claims made by Gilovich et al.

### *Recent and distant regrets*

First of all a simple descriptive analysis showed that only 4 regrets in total (5%) concerned events from within the most recent year of participants' lives, and only 32 (38%) concerned events from the most recent decade. This finding suggests that people do not naturally gravitate towards very recent events when selecting their regrets.

For the purpose of comparison with Studies 1 and 2 a simple analysis of temporal distribution was carried out using the regrets of participants over 40 years of age. The distributions of specific and general regrets in Figure 4.1 clearly show patterns similar to those in Study 1 and 2, with a distinct reminiscence bump for general regrets, 57% of which concern experiences from the 2<sup>nd</sup> and 3<sup>rd</sup> decades. By contrast only 11% of specific regrets concern experiences from this period, with the majority (63% ) concerning experiences from the 4<sup>th</sup> and 5<sup>th</sup> decades. Needless to say participants under 40 years of age reported all of their regretted experiences as coming from the second and third decades (43% and 57% respectively).



**Figure 4.1 The temporal distribution of specific and general regrets as a function of time in decade intervals for participants over the age of 40**

#### *Analysis of emergence*

As with Studies 1 and 2 a measure of emergence was derived by calculating the time elapsed between the source experience and the awareness of its regrettable consequences. For specific regrets the time lapse ranged from 0 to 17 years ( $M = 1.2$ ,  $SD = 3.1$ ), while for general regrets the range was much broader, from 0 to 41 years ( $M = 5.8$ ,  $SD = 8.5$ ). For 67% of specific regrets the consequences were regretted in less than a year, and 83% in less than two years. For general regrets, only 35% of the consequences were regretted in less than a year, and only 44% in less than two years. Due to concerns regarding unequal variances, these differences were compared using a non-parametric test. The median time elapsed for general regrets was 2yrs and the median time elapsed for specific regrets was 0 yrs, so the consequences of general regrets took significantly longer to emerge than those for specific regrets;  $U = 522.5$ ,  $p < .001$ ,  $r = .39$ , which is similar to what was found in

Studies 1 and 2, although the time lapses overall were considerably longer in those studies.

#### *Participant age and overall regret*

One factor not taken into account by Gilovich et al. is participant age. Wrosch and Heckhausen (2002) found that older participants experienced less regret overall than their younger counterparts, and in the present study there was a significant correlation between age and the overall measure of regret ( $r = -.42$ ,  $p < .001$ ) suggesting that the affective impact of regret diminishes as people get older. Although the strength of this relationship was somewhat attenuated when the time since awareness of the regret was controlled for, nonetheless it continued to be statistically significant ( $r = -.22$ ,  $p < .05$ ).

#### *Analysis of regret content*

As previously mentioned the regrets were coded for content and according to whether they were self- or other-focussed. The analysis of content shows the top six life domains ranked in descending order as follows: *Family*, “Not saying goodbye to my father, who died suddenly” (24%); *Intimate relationships*, “Splitting up with my ex the way I did” (16%); *Character*, “Not intervening on behalf of someone being bullied” (13%); *Multiple domains*, “Going straight to work from school and not having time for travel, fun, university” (13%); *Education*, “Not getting to University” (11%); *Work/Career*, “A job that I should have applied for” (10%). The ranking is consistent with the previous studies in the thesis and with the wider literature.

The analysis of self- and other-focussed regrets showed that 57% of the regrets could be described as self-focussed, 20% of which concerned experiences of personal achievement (*“Not getting my qualifications earlier”*) and the remaining 37% concerning self-actualisation (*“Taking drugs and ruining my chances in life”*). Thirty eight per cent of regrets were coded as other-focussed and these concerned a variety of experiences, but many appear to be tinged with bad conscience, either for having wronged others (*“The way I treated my boyfriend”*), or for having failed to take opportunities to do good for other, (*“Didn’t support my mum enough when she was dying”*), the latter being a typical example of regret for not ‘being there’ for a loved one. Other-focussed regrets also imply or describe a moral transgression (*“Not calling the police after witnessing an accident”*; *“Breaching the confidence of a close friend for the right and moral good.”*) and suggest different kinds of guilt/shame experiences. The remaining 6% of regrets were coded as miscellaneous (*“That my parents looked on the older sibling as second best”*).

#### 4.2.3 Summary of the main findings

Contrary to what has been found in previous studies in this thesis there was no significant overlap between regret specificity and agency, as neither specific nor general regrets were significantly more likely to be due to either action or inaction. Nonetheless, the results support the main predictions regarding the relationships between regret type and emotion cluster. Specific regrets were significantly more likely than general regrets to evoke hot and moral emotions, whereas general regrets were more likely than specific regrets to evoke wistful emotions. Despair emotions were less clearly associated with regret type and were as likely to be evoked by specific as by general regrets. With the exception of the results for the despair



cluster, these patterns replicate those found by Gilovich et al. for action and inaction regrets. Agency was less reliably able to discriminate between the clusters, and although action regrets were more likely than inaction regrets to be hot, inaction regrets were only marginally more likely than action regrets to be wistful and neither actions nor inactions were significantly more likely to be associated with the moral or despair clusters.

Overall, regret was more strongly associated with the moral emotions than with any other cluster, which is consistent with previous research linking regret with guilt and shame (Mandel, 2003; Saffrey & Summerville, 2008; Tangney, 1995; Zeelenberg, van Dijk, van der Pligt, Manstead, van Empelen & Reinderman, 1998) and with taxonomical studies associating regret with remorse (Shaver et al., 1987; Storm & Storm, 1987 ). Regret was also more frequently associated with despair emotions than with either the hot or wistful emotions, and this too reflects taxonomical associations found by Shaver et al., who consider sadness as a basic level category which includes despair and related emotions in one cluster and regret, remorse, guilt and shame in a cluster of their own.

Consistent with Studies 1 and 2 in this thesis, the general regrets of adults over 40 tended to concern events from the reminiscence bump period, whereas specific regrets tended to cluster in more recent decades, primarily decades four and five. The consequences of general regrets also took longer to emerge than did the consequences of specific regrets. An analysis of the relationship between participant age and overall measures of regret showed that older participants experienced less regret than did younger participants even when the age of the regret was controlled for, which is consistent with findings by Wrosch and Heckhausen (2002).

The results of the analysis between self-focussed and other-focussed regrets extend the distinction proposed by Berndsen et al. between self-actualisation regrets and guilt experiences. Two types of self-focussed regret were identified in the present study; those concerned with achievement and those concerned with other aspects of the self. These two types differed reliably in that self-actualisation regrets evoked more emotion overall, and more moral emotions than regrets involving achievement.

### **4.3 Chapter discussion**

Overall, the results of this study add to the general claim that models of autobiographical memory offer viable alternative interpretations for many of the effects found in the regret literature, not only those relating to regret's temporal profile but also to distinctions between regret and emotions such as guilt. For example, Berndsen et al. distinguish regret from guilt solely on the basis of a self-other focus, but an alternative suggested by the results of the present study is that a distinction can be made between guilty or highly moral regrets, which tend to concern specific events, and regrets of a less guilty or moral nature, which tend to concern general, achievement-related experiences.

The predicted patterns of relationships between event specificity and the emotion clusters were found despite the absence of an overlap between the specific-general / action-inaction distinctions, suggesting that the patterns have more to do with the way that events are represented in memory than with attributions of agency, which did not discriminate as clearly between the emotion clusters. Although the specific-action overlap has been unreliable throughout the preceding studies, the general inaction overlap has been relatively robust and the absence of the overlap

here prompts the question; what makes this study different? First of all participants in the present study had to provide a single regret of a designated type, and so it seems likely that they chose their single most important regret. Secondly, this is the only study where regret was explicitly associated with other emotions, especially the moral emotions. Although the design of the questionnaire required participants to first describe their regret and then turn to the emotion checklist, natural curiosity would lead most people to look at the entire questionnaire before beginning, which means they would have the emotion checklist in mind from the outset. This may have prompted participants to give greater consideration to the moral aspect of their regrets, as reflected in the high ratings for moral emotions and the relatively low ratings for wistful emotions. More than half (53%) of the regrets reported concerned family, intimate relationships, and character, whereas only 18% concerned work and education, which may explain why there were more general actions than is found when those achievement domains are better represented.

Many specific inaction regrets convey a sense of moral failing or bad conscience (turning down an opportunity to attend an anti-war rally; not calling the police after witnessing an accident), as do many general action regrets, which are more idiosyncratic and less obviously ‘scripted’ than the general regrets found in previous studies (having started to smoke; taking drugs at an early age; having an affair; telling lies; being unfaithful, and being thoughtless towards a loved one). It may simply be that the overlap between specificity and agency is blurred by the narrow focus created in this study.

Only four regrets in the present study concerned events from within the most recent year, which is a revealing finding given that participants could choose from any period of their lives. This has implications for the manipulations used by

Gilovich et al. and suggests that regrets for very recent events are either not as salient in memory as those from the entire lifetime, or are not as memorable for other reasons. Wrosch and Heckhausen (2002) found that the average age of ‘entire lifetime’ regrets was 21 years, and Wrosch et al. (2007) found that people’s ‘most severe’ regrets concerned events that happened between 28 and 35 years ago. Perhaps more striking is Strongman and Kemp’s (1991) finding that of the 912 mostly specific events recalled by their participants in response to emotion cue words, almost all were at least a month old, with only 14% that were less than a month old. Equally striking is Bonnefon and Zhang’s (2008) finding that of the 957 participants in their study, 766 (80%) reported regrets that were at least one year old. These findings suggest that defining recent and distant regrets in terms of the past week and the entire lifetime creates an artificial distinction which may lead to the comparison of two entirely different types of experience for which measures of affective ‘temperature’ are inadequate. There may be a need to distinguish regrets with primarily affective consequences (those that can be recollectively experienced for example) from those for which the consequences have more abstract, narrative impact.

On the whole Gilovich et al. introduced into regret research an important functional distinction which appears to be intuitively clear but which may be less so in reality. Lecci et al. (1994) associate the term regret with “unfulfilled or rueful goals and their associated ‘hot’ cognitions.”(p731) and whereas the present study found hot emotions to be statistically independent of wistful emotions, they were positively associated with the despair emotions, something also found by Wrosch and Heckhausen (2002) and Wrosch et al. (2007). The moral emotions were also strongly associated with hot and despair emotions, so the results of this study suggest

that additional distinctions are necessary to capture the many varieties of regret that people can experience and remember.

Finally, what of Berndsen et al.'s claim that regrets involving harm done to others are better thought of as guilt? The analysis along the self-other dimension suggests that a simple dichotomy is too crude to capture the complexity of regret and does not reliably distinguish it from guilt. In fact, it was easier to distinguish between the two types of self-focussed regret than it was to distinguish self-actualisation regrets from those involving other people. Although highly guilty regrets (those rated 5 on the *guilty* item) tended to concern other people, several were also directed towards the self ("starting to smoke"; "remarrying after divorce"; "giving in to a negative emotion and throwing away 2 years of education"; "having too much to drink and missing out on the main event of a hen party"; "taking drugs and ruining my chances in life"). Neither was it the case that highly guilty regrets only involved harm done to others; they also concerned good withheld ("not inviting friends and relatives of the deceased to a funeral") or not 'being there' for people ("not going away with a partner who died while away"; "not being with parent when they died"). There was considerable overlap between guilt and remorse; of the 17 regrets rated as highly remorseful, 10 were also rated as highly guilty, and of the 19 highly guilty regrets, 10 were also rated as highly remorseful. It must be noted however that while many regrets received high ratings on other emotions, the means overall were at the low end of the scale, suggesting that on the whole participants did not associate their regrets strongly with other emotions. Overall, the results of this study suggest that there is more to regret than can be represented by either hot/wistful or self/other distinctions and much more will need to be done before it is

possible to say whether regret is in fact a discrete emotion, and if so, how it might be distinguished from the emotions with which it is frequently associated.

## **Chapter 5: The consequences of regret**

### **5.0 Chapter overview**

This final empirical chapter reports the findings of a study that is primarily concerned with the impact of different types of regret on people's lives and with how patterns of impact might contribute to an interpretation of the temporal profile of regret. An operational definition of impact derived from the structure of the autobiographical memory knowledge base measures the number of life domains affected by each regret and the number of consequences it produces. The study is motivated by the intuition that general regrets are likely to have a broader impact over time than are specific regrets, because general regrets encompass broader time frames and have a greater explanatory role in the self narrative. Because general events tend to concern inactions it is suggested that this might partly explain the temporal pattern of regret. This claim is tested in contrast with a recent study making similar claims about impact but using agency as opposed to event specificity as an explanatory factor (Rajagopal, Raju & Unnava, 2005).

Other aspects of regret are also examined in the study, including people's awareness of the impact their regrets have for other people, their awareness of the positive consequences of their regrets, and differences between private and shared rehearsal.

### **5.1 Introduction: the impact of regret over time**

As was described in the introductory chapter, the impact of regret can be represented and measured in a variety of ways, but in everyday parlance people often

talk about the impact an experience has had on this or that area of their lives, often describing the knock-on consequences within or between domains. For example, regrets for missed educational opportunities are thought to be so frequent precisely because education is seen as a gateway to achievement in so many other domains of life (Roese, 2005; Roese & Summerville, 2005). Having no qualifications may limit a person's work options, which may in turn have consequences for their finances, their relationships, and even their health (Jokisaari, 2004). Although the actual impact a regrettable experience has on a person's life may depend on numerous affective and pragmatic factors, how that person perceives and describes the impact may have much to do with the way it is represented in autobiographical memory.

As was demonstrated in Studies 1 and 2, people tend to express their life regrets in general terms, both at the level of lifetime periods ("Not going to university") and summarised events ("Arguments with family"). Because such experiences can span periods from months to decades it is reasonable to assume that they are seen as having a broader impact over time than are regrets at the level of specific events ("An argument with my dad"), which span much shorter periods of time. Moreover, because general events are thematically organised (Conway & Rubin, 1993), connected by interlocking goals (Barsalou, 1988), and central to the coherence of the personal narrative (Bluck & Habermas, 2000) it is likely that general regrets, which have been shown to have scripted characteristics, have a prominent explanatory role in the self narrative.

Of course some specific regrets can also have far-reaching consequences (a drink driving offence that leads to a loss of one's driving license and job), but the consequentiality of such regrets may be viewed as having more to do with the nature of the event itself, (i.e., in practical terms a drink driving offence is inherently



consequential) and less to do with the specificity of the representation in memory, whereas it is the relatively abstract mnemonic structure of general regrets that contributes to their perceived impact. Because general regrets represent a broader category of event knowledge they will have nested within them many thematically linked lower level general consequences, which will in turn nest many specific consequences.

A similar argument framed in terms of agency rather than specificity is made by Rajagopal et al., who recruit memory-based mechanisms to test whether regret's temporal pattern is due to inaction regrets being more *available*<sup>2</sup>(more numerous) or more *accessible* (more easily retrieved) than action regrets. The authors reason that inaction regrets are more accessible than action regrets because they have a broader and deeper impact, and because inaction regrets affect more domains and have more consequences than do action regrets, they become associated with more cues in memory, which increases their chances of retrieval. In addition, inaction regrets are more frequently rehearsed (Savitsky et al., 1997) and this increases their salience in memory.

Rajagopal et al.'s studies include two measures of accessibility (retrieval time and order of retrieval), one measure of availability (total regrets listed in untimed recall), a measure of rehearsal (frequency of thought), and a temporal manipulation similar to that used by Gilovich and Medvec (1994; 1995) and Gilovich et al. (1998), whereby long term regrets are drawn from the entire lifespan and short term regrets are drawn from the previous week.

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<sup>2</sup>Rajagopal et al. use Tulving and Pearlstone's (1966) definition of availability as the existence of a trace in memory, and accessibility as the ease with which that trace is recalled. However, considerable ambiguity surrounds the definition and measurement of these concepts and many researchers treat availability as meaning easily accessible for recall (Asch & Ebenholtz, 1962b; Horowitz, Norman & Day, 1966; Tversky & Kahneman, 1973).

As neither accessibility nor availability are tested in the present study, Rajagopal et al.'s findings on these variables can be summarised as follows: accessibility was superior for long term inaction regrets, which were retrieved more quickly (Study 1) and were more frequently listed within a period of two and a half minutes (Study 2) than were long term action regrets. No differences in accessibility were found for short term regrets. No differences in availability were found between action and inaction regrets in either the long or short term.

On their measures of breadth and depth of impact Rajagopal et al. predicted that inaction regrets would affect more life domains and have more consequences than would action regrets, because the outcomes of inaction regrets are uncertain, and so they can have potentially unlimited consequences attributed to them, whereas the consequences of actions are limited by what has actually happened. As predicted, long term inaction regrets affected more domains than did long term action regrets. For short term regrets there were no differences. On the measure of depth of impact they found, as predicted, that long term inaction regrets produced more consequences than did long term action regrets. No difference was found for either action or inaction regrets in the short term. Depth of impact also increased over time for inaction regrets but not for action regrets.

Mixed results were obtained for rehearsal. When measured on a numerical scale, frequency of thought was greater for inactions than for actions, in both the short and long term; but when measured by asking participants which type of regret they thought about most frequently, only long term inactions were more frequently thought about.

In summary, Rajagopal et al. find that inaction regrets are more accessible than action regrets in the long term, affect more life domains, produce more consequences and occasion greater rehearsal than do long term action regrets.

No issue is taken here with Rajagopal et al.'s main findings, but there are issues regarding the memory-based mechanisms motivating their arguments, which are derived from serial recall and associative memory research. For example, the claim that inaction regrets are more accessible than action regrets because they are attached to more cues draws on an analogy with the "fan effect" (Anderson, 1974) from recognition memory research. This is the observation that adding facts to a knowledge concept in memory (increasing its "fan" structure) raises the probability that the concept will be activated. The argument for the greater availability of inaction regrets draws an analogy with the "list length effect" (Murdock, 1962) whereby more items are recalled from a longer list than from a shorter one: inaction regrets are seen as items on a list that gets longer over time than the list for action regrets, making inaction regrets more plentiful in memory.

It is doubtful that the consequences of regret, with their affective and narrative overlap, are thought about in the same way as semantic facts attached to a knowledge concept. Neither is it likely that the list length effect describes the process of retrieving life regrets, because this effect applies to the recall or recognition of words on a list in a short-term memory study where the items are literally of no consequence to the participant. Such analogies ignore the motivational core of regret and autobiographical memory.

Whether such analogies are valid is questionable; but they are not even necessary, as Rajagopal et al.'s findings can be accounted for by models of autobiographical memory if the overlap between general-inaction and specific-action

regrets is assumed. The superior accessibility of general inaction regrets for instance can be explained by the fact that the general level of event representation is the preferred level of access to the autobiographical memory knowledge base (Conway & Pleydell-Pearce, 2000) and general level events are known to provide quicker access when used as primes (Conway & Bekerian, 1987; Reiser, Black & Abelson, 1985). The alternative proposed here is very simple: since inaction regrets tend to be general in nature they will touch more domains, be attached to more consequences, and be more frequently rehearsed than action regrets, which tend to concern specific events.

#### *Overview of Study 6 and main predictions*

The main predictions of Study 6 are predicated on finding a significant overlap between general/inaction regrets and specific/action regrets. Following this, it is expected that the impact effects found by Rajagopal et al. for agency will be mirrored for regret specificity, such that general regrets will affect more domains, have more consequences overall, and have more consequences per domain than will specific regrets. General regrets are also expected to be rated higher on measures of rehearsal than are specific regrets.

Some additional variables not tested by Rajagopal et al. are included in this study. Two measures tap the self-referential nature of regret; these are measures of perceived impact for the self and other people, and awareness of the consequences for the self and other people. Autobiographical memory is self-serving (Conway, 2005), and regret is a self-focussed emotion (Mandel, 2003), but research presented in the previous chapter shows that some regrets are also other-focussed, implying an awareness of the impact of one's behaviours on others. On the whole perceived

impact and awareness of consequences are expected to be greater for the self than for other people. In addition, the awareness of consequences measure is taken for two points in time: the time of the regrettable experience and the time of participating in the study. This latter manipulation is included because it has been suggested that inaction regrets have emergent consequences (Gilovich et al., 1998) and in Studies 1 and 2 evidence of emergence was provided for general regrets. If this is the case, awareness of consequences for general regrets should be greater in the present than at the time of the source experience. Awareness for the consequences of specific regrets is more likely to be greater at the time of the event.

A similar then/now measure of importance is also included, and for similar reasons. If consequences become apparent in hindsight, then so should the importance of the source experiences increase when their consequentiality is recognised. Specific regrets on the other hand, which have relatively instant and short-lived consequences, would be expected to diminish in importance over time.

Also measured is participants' awareness of positive consequences, as recent work suggests that people can readily see the positive aspects of regret (Saffrey, Summerville & Roese, 2008) and so it is expected that participants will be able to list positive consequences to their regrets. A direct measure of perceived impact is expected to correlate positively with the indirect measures of impact (breadth and depth).

Two measures of rehearsal (private and shared) are included in this study. Rajagopal et al. found that inaction regrets were thought about more often than action regrets, and although they allude to the possibility that rehearsal includes talking about one's regrets to others they do not measure shared rehearsal. In this study people will be asked explicitly to say how much they have thought (private

rehearsal) or talked (shared rehearsal) about their regrets. Overall differences are expected for both the private and shared rehearsal, such that ratings of private rehearsal will be greater than those for shared rehearsal, as the association between regret and rumination is well established (Jokisaari, 2003, 2004; Savitsky et al., 1997; Wrosch & Heckhausen, 2002), while negative events are assumed to be less frequently shared socially (Berntsen & Rubin, 2004; Rubin & Berntsen, 2003). Directional differences for rehearsal are expected to mirror those found by Rajagopal et al. for action and inaction regrets, which is to say that general regrets will be more frequently rehearsed than will specific regrets. Finally, in line with previous research linking regret with personal responsibility (Zeelenberg, van Dijk, Manstead & van der Pligt, 1998), a measure of personal responsibility is included.

No temporal manipulation is included in the present study, as the distinction used by Rajagopal et al. between regrets from the past week and those from the entire life was deemed unsuitable for comparisons along the specific-general dimension. It has been shown that retrieval of emotional experiences shifts from episodic (specific) to semantic (general) memory over very short time frames (Robinson & Clore, 2002a,b), meaning that regrets from the past week would be expected to involve disproportionate numbers of discrete episodes, whereas general events would be relatively few. There are no accessibility or availability manipulations in the present study.

## 5.2 Study 6: measuring the impact of regret

### 5.2.1 Method

#### *Participants*

Fifty three people took part in this study, 42 females and 11 males ranging in age from 17 to 61 years ( $M = 31.7$ ,  $SD = 11.7$ ). The sample comprised students and staff from various faculties within Durham University and members of the general public recruited from the Durham, Stockton and South Tyneside areas. The educational profiles of the respondents were as follows; *secondary 1* (2%), *advanced secondary 13* (24%), *degree 8* (15%), *postgraduate* or equivalent *31* (59%).

#### *Design, Materials and Procedure*

The study had a within-participants design and took the form of a semi-structured interview for which participants were paid £5 for a session lasting up to 1 hour. The interview was conducted by the researcher personally, either in a dedicated office in the Applied Psychology Department at Durham University's Queen's Campus, or in a handful of cases (5) where participants were unable to travel, interviews were conducted in participants' homes.

Participants were recruited through colleagues, through e-mails sent out to various faculties at Queen's Campus, and through personal contacts. Prospective participants were told that the study was about regret and that it would take the form of a semi-structured interview. They were told that they would be asked questions relating to something they regretted, but would not be asked to disclose the content of the regretted experience itself. They were assured that at no point would they be

required to disclose any information of a personal or embarrassing nature and anonymity and confidentiality were assured.

At the start of the interview participants received the following sheet, which contained an outline of the study.

*This is a study about regret and memory. In particular, it is about how people remember their regrettable life experiences.*

*You will be asked to think of experiences that you regret, but you will not be asked to disclose the content of your regrets. You will answer questions related to the experiences, but you won't have to disclose the experiences themselves.*

*The study takes the form of a semi-structured interview in which you will fill out a questionnaire and answer some questions. Nothing you say will be recorded and your age, sex and level of education are the only personal details you will be asked to disclose. Your participation is entirely voluntary and you are free to withdraw at any point.*

*After reading the outline of the study and supplying demographic details and consent, participants received a sheet of paper with the following instructions:*

*I would like you to take some time to think about your life and to think of anything that you regret or have regretted in life. It can be something you did or didn't do, a missed opportunity, a bad decision, or an unfulfilled dream. It doesn't matter whether it seems trivial or important, so long as it is something that concerns you personally and which caused/causes you to feel regret.*



*Use the paper provided to write your regrets down. This is to help you remember the experiences and you can keep or destroy it when the session is over. You will be given a questionnaire to fill in. There are no right or wrong answers to the questions, but it's very important that you answer them as accurately and truthfully as you can. I will go through the questionnaire with you to explain certain things.*

Participants were told to take as long as necessary to think of the regrets and at this point the interviewer took the opportunity to leave the room. Participants wrote down their regrets at their leisure in private, and at no point could the interviewer see what they had written down. Once participants had written down all of their regrets they were told that for each regret they would be asked the same series of questions. The first question concerned the specificity of the regretted experience and participants were asked whether the regret concerned an experience that had happened within the space of a single day (a specific regret) or over a longer period (a general regret).

For a specific regret they were then asked whether the feeling of regret was instant or delayed. If it was delayed they were asked to estimate whether the delay could be measured in days, weeks, months or years. They were then asked how old they had been at the time of the regretted experience. Then they were asked about agency and whether the regret was due to something they had done, failed to do, whether it was due to both, or neither. The order of these terms was alternated between participants.

For a general regret the questions varied slightly. Because general regrets span wider time frames, participants were first asked to estimate whether their regrettable experience spanned days, weeks, months or years. They were asked to

estimate their age at the time they had become conscious of the feeling of regret and then to estimate their age at the time of the source experience. If the regret concerned something they had failed to do, they estimated how old they were when they felt they first could have avoided the regretted inaction. Although participants could supply an exact age if they wanted, most general regrets have diffuse temporal origins, and so participants estimates were often expressed in ranges of years and to the nearest decade. The questions about agency were the same as those asked for a specific regret.

After this series of questions had been asked about each of the participant's regrets, the interview part of the study was over and participants completed the second part on their own. For the second part of the study participants received a two page booklet corresponding to each individual regret. A complete example of the booklet is presented in Appendix A, but the materials are presented here in summarised format. The first sheet was split into 5 sections, each containing either one or two questions. All responses were indicated on a seven point scale.

*Question 1* addressed the past and present **importance** of the regretted experience. It was in two parts.

- a) *How important to your life **at the time** was the thing that you regret?*
  - b) *How important to your life **now** is the thing that you regret?*
- (1 = not at all important; 7 = very important).

*Question 2* assessed the perceived **impact** of the regretted experience for the self and other people.

- a) *How much impact has the thing that you regret had on your life?*

- b) *As far as you can judge, how much impact has the thing that you regret had on the lives of other people?*

(1 = no impact at all; 4 = moderate impact; 7 = huge impact)

*Question 3* included two measures of **rehearsal**; private and shared

- a) *I have thought about this regret*

(1 = never before now; 4 = occasionally; 7 = frequently)

- b) *I have talked about this regret to other people*

(1 = never; 4 = occasionally; 7 = frequently)

*Question 4* concerned participants' **awareness of the impact** (i.e., consequences) of the regretted experience at the time for the self and other people.

- a) *At the time of the thing that you regret, how aware were you of the consequences for other people?*

- b) *At the time of the thing that you regret, how aware were you of the consequences for you personally?*

(1 = not at all aware; 4 = somewhat aware; 7 = very aware)

*Question 5* addressed personal **responsibility** for the regretted experience:

*How personally responsible do you feel for the thing that you regret?* ( 1 = not at all; 4 = somewhat; 7 = totally)

After these questions had been answered participants went on to the second sheet, which contained a tabular list of 12 life domains derived from Studies 1 and 2.

Participants received the following written instructions, which were further clarified verbally by the researcher:

*I would like you to choose from the list below those areas of your life which have been affected by the thing that you regret. You can tick as many as necessary. For each area of your life that has been affected, please try to estimate the number of positive and negative consequences that have resulted from the thing that you regret. Use the scrap paper provided to list all the consequences and then add them up to give a total for each separate area.*

Participants were verbally informed that they should list all the consequences as they came to mind, in any order they came, and although there was no time constraint on this part of the task, participants were told to list only the ‘obvious’ consequences. This was explained as meaning that they should not try to think of all the hypothetical consequences, which are potentially limitless, but only those consequences that they themselves could perceive or had knowledge of. This was particularly important in cases where more than one domain was obviously affected by an experience. Once they had listed as many consequences as they could think of, participants then had to tally up the positive and negative consequences in each domain, which they entered into the two corresponding columns on the list. This procedure was repeated for each individual regret.

Upon completion of the listing task, participants were verbally debriefed and given the opportunity to ask questions about the study, though no information could be given about the hypotheses being tested. They were also given the option of taking their sheets of consequences (which many did) or destroying them in the shredder. Participants were paid and the session was concluded.

### 5.2.2 Results

#### *Descriptive statistics*

In total, 53 participants produced 204 regrets, 41 of which were specific and 163 of which were general. As only 27 participants reported having at least one specific and one general regret the within-subjects specific-general analyses along the main variables of interest (breadth, depth, awareness of consequences etc) involve only regrets from the subsample of those participants who produced at least one of each type. This means that for those analyses only 35 specific and 71 general regrets are included. Because some direct comparisons are made with Rajagopal et al. on measures of breadth and depth of impact, comparable analyses are also carried out using agency as the dimension of contrast, and using only the action and inaction regrets from the 33 participants who had at least one of each type. To measure the interaction between specificity and agency on each of the main variables would require unnecessary subdivision and the exclusion of even more participants, so to avoid such subdivision the analyses of the main measures are carried out for each of the two distinctions separately. For certain descriptive and other analyses regrets from the whole sample are included ( $N = 53$ ).

One further consideration concerns the absence of a temporal manipulation in the present study, which makes certain direct comparisons with Rajagopal et al. (2006) impossible. Although some temporal measures are reported which have a bearing on relative psychological and chronological ‘distance’, there is no comparable measure of recency.

### *Analysis of the overlap between regret type and agency*

Unlike previous studies in the thesis, there are no regret descriptions and participants designated their own regrets along the dimension of agency. In total, 35% of regrets were attributed to actions, 44% to inactions, 17% to both action and inaction, and 4% to neither action nor inaction. Consistent with the procedure adopted in Studies 1-4c in this thesis, the overlap between the specific/general and action/inaction distinctions was analysed by calculating the proportion of each participant's regrets (all those coded as action, inaction, both or neither) that fell into each of four categories: specific action; general action; specific inaction; and general inaction.

The proportions were entered into a 2 (type: specific/general) by 2 (agency: action/inaction) ANOVA. The analysis revealed a significant main effect of regret type;  $F(1, 52) = 35.23$ ,  $MSE = .06$ ,  $p < .001$ ,  $\eta_p^2 = .40$  showing that the proportion of general regrets was higher than the proportion of specific regrets. Although the proportion of inaction regrets ( $M = .44$ ,  $SD = .28$ ) was greater than the proportion of action regrets ( $M = .35$ ,  $SD = .27$ ) there was no main effect of agency,  $F(1, 52) = 1.75$ ,  $p > .05$ , but there was a significant interaction between regret type and agency;  $F(1, 52) = 44.71$ ,  $MSE = .04$ ,  $p < .001$ ,  $\eta_p^2 = .46$ . Planned comparisons of the significant interaction showed specific regrets to be significantly more likely to be due to action ( $M = .17$ ,  $SD = .20$ ) than to inaction ( $M = .02$ ,  $SD = .08$ );  $t(52) = 5.10$ ,  $p < .005$ ,  $r = .58$ . General regrets were significantly more likely to be due to inaction ( $M = .42$ ,  $SD = .29$ ) than to action ( $M = .18$ ,  $SD = .21$ );  $t(52) = 4.36$ ,  $p < .005$ ,  $r = .52$ .

### *Analyses by specificity*

The summary statistics for all of the variables used in the main analyses by specificity are presented in Table 5.1.

*Domain breadth (domains affected).* The first measure of *breadth of impact* was the number of domains affected by each regrettable experience. To compare the differences between regret types, the means for domains affected by specific and general regrets were entered into a paired samples t-test. General regrets affected significantly more domains than did specific regrets;  $t(26) = 4.20$ ,  $p < .001$ ,  $r = .63$ .

*Global impact (number and valence of consequences).* The second measure of impact was the overall number of consequences listed for each type of regret, which Rajagopal et al. call depth of impact, but which in the present study is taken as another measure of breadth and is simply called *global impact*. As participants listed both positive and negative consequences, the means for each type were entered into a 2 (regret type: specific/general) by 2 (valence: positive/negative) ANOVA. The analysis revealed a significant main effect of regret type;  $F(1, 26) = 40.56$ ,  $MSE = 13.73$ ,  $p < .001$ ,  $\eta_p^2 = .61$ , such that general regrets had significantly more consequences overall than did specific regrets. As might be expected there was a significant main effect of consequence valence;  $F(1, 26) = 19.64$ ,  $MSE = 14.18$ ,  $p < .001$ ,  $\eta_p^2 = .43$ , such that significantly more negative consequences were listed than were positive consequences. The interaction between regret type and valence of consequence did not reach significance;  $F = 1.48$ ,  $p > .05$ .

**Table 5.1 Analysis by specificity: descriptive statistics for all critical variables, including means, standard deviations, for combined, specific and general regrets ( $N = 27$ )**

<i>No. of regrets</i>	<b><i>Combined</i></b> <b>(<i>n</i> = 106)</b>		<b><i>Specific</i></b> <b>(<i>n</i> = 35)</b>		<b><i>General</i></b> <b>(<i>n</i> = 71)</b>	
	<b>M</b>	<b>(SD)</b>	<b>M</b>	<b>(SD)</b>	<b>M</b>	<b>(SD)</b>
<b>Domains</b>	<b>5.56</b>	<b>(1.67)</b>	<b>4.08</b>	<b>(1.89)</b>	<b>6.30</b>	<b>(2.31)</b>
<b>Consequences</b>						
<i>Positive</i>	3.32	(2.28)	1.85	(1.83)	4.14	(3.43)
<i>Negative</i>	8.22	(4.15)	5.47	(3.84)	9.60	(5.74)
<b>Total</b>	<b>11.54</b>	<b>(5.01)</b>	<b>7.32</b>	<b>(4.57)</b>	<b>13.74</b>	<b>(6.93)</b>
<i>Per domain</i>	1.96	(.64)	1.81	(.69)	2.12	(.82)
<b>Awareness of consequences</b>						
<i>For self</i>	3.81	(1.31)	3.95	(1.99)	3.79	(1.52)
<i>For other</i>	3.10	(1.46)	3.24	(2.11)	2.97	(1.63)
<b>Impact</b>						
<i>For self</i>	4.82	(1.01)	4.07	(1.71)	5.07	(1.23)
<i>For other</i>	3.80	(1.09)	3.79	(2.01)	3.84	(1.26)
<b>Importance</b>						
<i>Then</i>	4.61	(1.43)	4.90	(2.16)	4.55	(1.65)
<i>Now</i>	4.78	(1.02)	4.10	(1.99)	5.01	(1.26)
<b>Rehearsal</b>						
<i>Freq of thought</i>	5.22	(.67)	4.82	(1.21)	5.41	(.93)
<i>Talking to others</i>	3.45	(.94)	3.17	(1.48)	3.60	(1.20)
<b>Responsibility</b>	5.82	(.72)	5.89	(1.19)	5.72	(.97)

*Local impact (consequences per domain).* Rajagopal et al. suggest that inaction regrets might have more consequences in some domains than in others, although they do not directly test this assumption. It is tested here by comparing the



mean number of consequences per domain as another measure of breadth of impact, which for convenience is called *local impact*. Overall, general regrets had more consequences per domain than did specific regrets and this difference was marginally significant;  $t(26) = 1.96$ ,  $p = .06$ ,  $r = .36$ .

*Awareness of consequences (for the self and others).* A 2 (regret type: specific/general) by 2 (awareness of consequences: for self/other) repeated measures ANOVA was run to assess the extent to which people are aware of the consequences their regretted experiences have for themselves and for other people, and whether this awareness differs according to regret type. The analysis revealed a significant main effect of awareness focus;  $F(1, 26) = 7.86$ ,  $MSE = 2.01$ ,  $p < .01$ ,  $\eta_p^2 = .23$ , with greater awareness of consequences reported for the self than for other people. There was no main effect of regret type;  $F(1, 26) = .34$ ,  $p > .05$ , and no significant interaction between regret type and awareness focus;  $F(1, 26) = .06$ ,  $p > .05$ .

*Perceived impact (on self and others).* Perceived impact on the self and other people was measured by means of a 2 (regret type: specific/general) by 2 (impact: self/others) repeated measures ANOVA. The analysis revealed no significant main effect of regret type;  $F(1, 26) = 2.09$ ,  $p > .05$ , but a significant main effect of focus of impact;  $F(1, 26) = 16.38$ ,  $MSE = 15.25$ ,  $p < .001$ ,  $\eta_p^2 = .39$ , such that perceived impact was greater for the self than for others. There was also a significant interaction between regret type and focus of impact;  $F(1, 26) = 4.83$ ,  $MSE = 1.26$ ,  $p < .05$ ,  $\eta_p^2 = .16$ , which Tukey HSD tests showed was driven by general regrets, which were rated significantly more impactful for the self than for other people;  $t(26) = 4.26$ ,  $p < .01$ ,  $r = .64$ . A similar comparison for specific regrets was non-significant;  $t(26) = .99$ ,  $p > .05$ ,  $r = .19$ .

A simple analysis was carried out to test the assumption that impact can be measured by the number of domains affected and consequences produced by a regret. The self/other ratings for perceived impact were combined ( $M = 4.51$ ,  $SD = .86$ ) and correlated with the means for domain breadth and global impact. Overall ratings of perceived impact were positively correlated with domain breadth, but the correlation was only marginally significant;  $r = .26$ ,  $p = .06$ . Impact ratings were significantly correlated with the mean number of consequences however;  $r = .32$ ,  $p < .03$ .

*Importance over time (then/now).* A 2 (regret type: specific/general) by 2 (importance: then/now) repeated measures ANOVA revealed no significant effect of regret type,  $F = .85$ ,  $p > .05$ , and no main effect of importance over time;  $F = .20$ ,  $p > .05$ . Although the interaction between regret type and importance over time did not reach significance;  $F = 2.00$ ,  $p = .097$ , it was close enough to warrant a comparison of the means, which show that general regrets are perceived to be marginally more important in the present than are specific regrets;  $t(26) = 2.00$ ,  $p = .06$ ,  $r = .36$ .

*Rehearsal (private / shared).* The two measures of rehearsal are frequency of thought (*private rehearsal*) and talking to others (*shared rehearsal*). The means from these variables were entered into a 2 (regret type: specific/general) by 2 (rehearsal type: private/shared) repeated measures ANOVA. There was a marginally significant main effect of regret type;  $F(1, 26) = 3.86$ ,  $MSE = 1.83$ ,  $p < .06$ ,  $\eta_p^2 = .13$ , such that general regrets were rehearsed on average more than specific regrets. There was a significant main effect of rehearsal type, in that both types of regret were significantly more likely to be thought about (*private rehearsal*) than talked about (*shared rehearsal*);  $F(1, 26) = 66.48$ ,  $MSE = 1.21$ ,  $p < .001$ ,  $\eta_p^2 = .72$ . There was no significant interaction between these two variables;  $F = .17$ ,  $p > .05$ .

*Personal responsibility.* For the final measure, no directional differences were predicted, and none were found, as ratings of personal responsibility did not differ between regret types;  $t(26) = .59$ ,  $p > .05$ ,  $r = .11$ . However, the mean rating overall is 5.82, which is close to the top end of the rating scale and suggests a strong sense of personal responsibility is associated with the experience of regret.

#### *Analyses by agency*

All of the analyses carried out for specificity were also carried out for agency, thus providing a direct comparison with those variables tested by Rajagopal et al., as well as providing interesting contrasts between specificity and agency on variables not tested by Rajagopal et al. In line with the criteria used for the specific-general comparisons, only those participants who had at least one regret of action and one regret of inaction were included. Thirty three participants met this criterion. For the whole sample ( $N = 53$ ), 35% were described as actions, 44% as inactions, 17% described as involving both an action and inaction, and 4% were described as being due to neither action nor inaction. For the subsample of 33 participants who had at least one action and one inaction regret, these frequencies changed to 46% (actions) 48% (inactions), 5% (both), and 1% (neither). The summary statistics for all of the variables used in the analyses by agency are presented in Table 5.2.

*Domain breadth (domains affected).* Using the average number of domains affected per regret, a t-test showed that on average, the impact of inaction regrets was not significantly broader than the impact of action regrets;  $t(32) = .47$ ,  $p > .05$ ,  $r = .08$ .

*Global impact (total number of consequences).* The means for each type were entered into a 2 (agency: action/inaction) by 2 (valence: positive/negative)

ANOVA. The analysis revealed no main effect of agency,  $F(1, 32) = .56$ ,  $MSE = 15.60$ ,  $p = .46$ ,  $\eta_p^2 = .02$ , so neither action nor inaction regrets differed significantly in the number of consequences they produced. As might be expected there was a significant main effect of consequence valence;  $F(1, 32) = 28.81$ ,  $MSE = 19.61$ ,  $p < .001$ ,  $\eta_p^2 = .46$ , such that significantly more negative consequences were listed than were positive consequences. The interaction between agency and valence of consequence did not reach significance;  $F = .08$ ,  $p > .05$ .

*Local impact (consequences per domain).* As would be expected from the two previous analyses, there was no significant difference between the number of consequences per domain attached to inaction and action regrets;  $t(32) = .26$ ,  $p > .05$ ,  $r = .04$ .

*Awareness of Consequences (for self and other).* A 2 (agency: action/inaction) by 2 (awareness of consequences: for self/other) repeated measures ANOVA revealed a significant main effect of awareness focus;  $F(1, 32) = 8.19$ ,  $MSE = 2.33$ ,  $p < .01$ ,  $\eta_p^2 = .20$ , with greater awareness of consequences reported for the self than for other people. There was no main effect of agency;  $F(1, 32) = .39$ ,  $MSE = 4.15$ ,  $p > .05$ ,  $\eta_p^2 = .01$ , and no significant interaction between agency and awareness focus;  $F(1, 32) = .03$ ,  $MSE = 1.13$ ,  $p > .05$ ,  $\eta_p^2 = .001$ .

*Perceived impact.* Perceived impact on the self and other people was measured by means of a 2 (agency: action/inaction) by 2 (impact: self/others) repeated measures ANOVA. The analysis revealed no significant main effect of agency;  $F(1, 32) = .39$ ,  $MSE = 4.15$ ,  $p > .05$ ,  $\eta_p^2 = .01$ , but as with the analysis of specificity, there was a significant main effect of focus of impact;  $F(1, 32) = 37.89$ ,  $MSE = 1.06$ ,  $p < .001$ ,  $\eta_p^2 = .54$ , such that perceived impact was greater for the self than for others.

**Table 5.2 Analysis by agency: descriptive statistics for all critical variables, including means, standard deviations, and sample sizes (N) for combined, action and inaction regrets (N = 33)**

<i>No. of regrets</i>	<i>Combined</i> ( <i>n</i> = 122)		<i>Action</i> ( <i>n</i> = 60)		<i>Inaction</i> ( <i>n</i> = 62)	
	<b>M</b>	<b>(SD)</b>	<b>M</b>	<b>(SD)</b>	<b>M</b>	<b>(SD)</b>
<b>Domains</b>	<b>5.64</b>	<b>(1.93)</b>	<b>5.52</b>	<b>(2.67)</b>	<b>5.76</b>	<b>(2.16)</b>
<b>Consequences</b>						
<i>Positive</i>	3.60	(2.26)	3.27	(1.99)	3.92	(3.31)
<i>Negative</i>	7.60	(4.17)	7.40	(4.69)	7.77	(5.64)
<b>Total</b>	<b>11.20</b>	<b>(5.05)</b>	<b>10.63</b>	<b>(5.77)</b>	<b>11.45</b>	<b>(7.34)</b>
<i>Per domain</i>	2.01	(.73)	2.02	(.80)	1.98	(1.02)
<b>Awareness of consequences</b>						
<i>For self</i>	3.85	(1.47)	3.69	(1.99)	3.94	(1.66)
<i>For other</i>	3.01	(1.44)	2.96	(1.66)	3.15	(1.85)
<b>Impact</b>						
<i>For self</i>	4.97	(1.09)	4.40	(1.46)	5.53	(1.62)
<i>For other</i>	3.87	(1.31)	3.94	(1.74)	3.79	(1.95)
<b>Importance</b>						
<i>Then</i>	4.77	(1.30)	4.67	(1.79)	4.87	(1.79)
<i>Now</i>	4.81	(1.09)	4.37	(1.69)	5.26	(1.21)
<b>Rehearsal</b>						
<i>Freq of thought</i>	5.28	(.82)	5.10	(1.07)	5.45	(1.07)
<i>Talking to others</i>	3.68	(1.31)	3.37	(1.76)	3.99	(1.52)
<b>Responsibility</b>	5.64	(.64)	5.65	(1.05)	5.64	(1.29)

There was also a significant interaction between agency and focus of impact;  $F(1, 32) = 11.34$ ,  $MSE = 1.20$ ,  $p < .003$ ,  $\eta_p^2 = .26$ , which Tukey HSD post hoc comparisons showed to be driven by inaction regrets, which were rated significantly more impactful for the self than for other people;  $t(32) = 6.01$ ,  $p < .01$ ,  $r = .72$ . A

similar comparison for action regrets showed that although the perceived impact was greater for the self than for others, the difference did not reach significance after applying the Tukey HSD correction;  $t(32) = .1.98$ ,  $p = .06$ ,  $r = .33$ .

*Importance over time.* A 2 (agency: action/inaction) by 2 (importance: then/now) repeated measures ANOVA revealed a marginally significant effect of agency,  $F(1, 32) = 3.39$ ,  $MSE = 2.46$ ,  $p = .06$ ,  $\eta_p^2 = .11$  in favour of inaction regrets, but there was no main effect of importance over time;  $F(1, 32) = .02$ ,  $MSE = 2.79$ ,  $p > .05$ ,  $\eta_p^2 = .001$ , and no significant interaction between agency and importance over time;  $F(1, 32) = 1.58$ ,  $MSE = 2.51$ ,  $p > .05$ ,  $\eta_p^2 = .05$ .

*Rehearsal (private/shared).* The final analysis involving direct comparison with Rajagopal et al. compares the extent to which action and inaction regrets differ in terms of rehearsal. The means for private and shared rehearsal were entered into a 2 (agency: action/inaction) by 2 (rehearsal: private/shared) repeated measures ANOVA. The analysis revealed that there was a marginally significant effect of agency, such that the overall mean rehearsal score for inaction regrets was marginally greater than the overall mean rehearsal rating for action regrets;  $F(1, 32) = 4.12$ ,  $MSE = 1.92$ ,  $p = .05$ ,  $\eta_p^2 = .11$ . There was also a significant effect of rehearsal type, with higher means reported for *private rehearsal* than for *shared rehearsal*;  $F(1, 32) = 58.84$ ,  $MSE = 1.43$ ,  $p < .001$ ,  $\eta_p^2 = .65$ . The interaction between agency and rehearsal type was not significant;  $F(1, 32) = .61$ ,  $p > .05$ .

*Responsibility.* Neither action nor inaction regrets differed significantly in ratings of responsibility;  $t(32) = .03$ ,  $p = .98$ ,  $r = .01$ .

### *Temporal factors*

Although no temporal manipulation is used in the present study, a simple analysis revealed that of the 106 regrets produced by the subsample of participants with one regret of each type, only 13 regrets (5 specific, 8 general) concerned experiences from within a year of participation in the study. This suggests that very recent experiences are not highly accessible.

An analysis was carried out to examine the time elapsed between the source experience and the awareness of its regrettable consequences, although the measures used in this study differ from those in Studies 1, 2, and 5 in that the dependent variables are categorical. For specific regrets participants indicated whether the experience of regret followed immediately, after days, weeks, months, or years. For general regret participants indicated the time period (days, weeks, months, or years) spanned by the regretted experience.

### *Analysis of specific regrets*

For specific regrets, 21 were regretted instantly, 7 within days, 2 within weeks, 4 within months, and only 1 specific regret emerged after a period of years. As these frequencies are not independent, a Chi square analysis was not appropriate, so they were converted into mean proportions and entered into a single sample t-test (see Appendix B). Only specific events that were instantly regretted ( $M = .64$ ,  $SD = .48$ ) were significantly different from chance, which was set at  $1/5 = .20$ ;  $t(26) = 4.88$ ,  $p < .001$ ,  $r = .69$ .

### *Analysis of general regrets*

Estimates of the time period covering the regrettable experience involved in their general regrets confirm the view that such regrets mostly concern experiences extending over long periods. In total, 37 spanned years, 25 spanned months, eight spanned weeks, and only one regret spanned days. As with the analysis of specific regrets these frequencies were converted into proportions of the total number of general regrets and entered into a single sample t-test, with a critical value set at  $1/4 = .25$ . After applying the Bonferroni correction for multiple comparison, only the proportion of general regrets spanning years ( $M = .49$ ,  $SD = .33$ ) was significantly greater than would be expected by chance;  $t(26) = 3.77$ ,  $p < .005$ ,  $r = .59$ . The proportion of general regrets spanning months ( $M = .37$ ,  $SD = .32$ ) was greater than chance, but failed to reach significance;  $t(26) = 2.01$ ,  $p > .05$ ,  $r = .37$ . The proportions of regrets spanning weeks ( $M = .12$ ,  $SD = .23$ ) and days ( $M = .01$ ,  $SD = .05$ ) were both significantly lower than chance ( $ts -2.83$ ,  $-26.00$ ; both  $ps < .01$ ).

### *Analysis of content*

In Studies 1-5 the analysis of regret content was carried out using participants' own descriptions, with life domains being derived from the descriptions themselves. In the present study, the reverse is the case, as participants were not required to describe their regrets or disclose any information about the consequences of the regrets. Consequently, the content of participants' regrets is not known and the possibilities for analysis are limited. However, some worthwhile comparisons can be made. Table 5.3 shows the life domains ranked in order of the total number of consequences per domain across the whole sample.



The ranking of life domains in Table 5.3 is a balance between the absolute frequency of consequences, the average number of consequences each participant reported for each domain, and the number of participants who had regrets in each domain (N). What is striking about these frequencies is that the domain of *character* not only produces considerably more consequences than any other domain, but it is the only domain in which everyone recorded at least one regret, followed by *self-development* and *family, friendships, and intimate relationships*

The rankings suggest strong differences between regrets concerned with the self and those involving other people. But without descriptions as a guide, differentiation along these dimensions would be purely speculative and possibly misleading. First of all, the number of domains affected by each regret ranged from 3 to 12 ( $M = 5.9$ ,  $SD = 1.95$ ), so the domains are not mutually exclusive. Furthermore, regrets are often framed in terms of a trade off between domains (family versus career for example) and self-development may also involve or implicate other people.

**Table 5.3 Life domains ranked by the total number of consequences per domain (Cons), with mean consequences per domain (M), standard deviations, and percentage of positive and negative consequences**

Domain	Cons	M	(SD)	N	% - ive	%+ ive
Character	420	2.03	(1.20)	53	63	37
Family	372	2.10	(1.91)	50	74	26
Self-development	367	1.83	(1.25)	52	60	40
Intimate relationships	294	1.66	(1.10)	47	73	27
Friendship	289	1.56	(1.00)	48	64	36
Work	200	1.19	(.98)	43	66	34
Education	192	1.10	(.89)	45	62	38
Health	174	1.17	(1.17)	37	82	18
Material	169	1.23	(1.47)	38	63	37
Hobbies	108	.79	(.61)	34	71	29
Location	93	.91	(.89)	30	62	38
Travel	87	1.83	(1.25)	38	64	36

### 5.2.3 Summary of the main findings

The main predictions of this study were supported by the results. First of all a significant overlap was found between the two distinctions, such that general regrets were significantly more likely to concern inactions than actions, while specific regrets were significantly more likely to concern actions than inactions. Secondly, Rajagopal et al.'s impact and rehearsal effects were replicated for general

and specific regrets: general regrets affected more domains, had more consequences overall, and more consequences per domain than did specific regrets. Comparable analyses along the action-inaction distinction failed to replicate these results. On the main measure of rehearsal (frequency of thought) general regrets were only marginally more likely to be thought about than were specific regrets, and an almost identical pattern was found for inaction and action regrets respectively.

Ratings of perceived impact correlated positively with the measures of breadth and depth and were higher for the self than for other people, particularly in the case of general regrets. Participants were also significantly more aware of the consequences for themselves than for other people. More than a quarter of all consequences listed were considered to be positive, suggesting that people are able to identify silver linings when required to, as others have also found (Saffrey, Summerville & Roese, 2008). Predictions regarding attributions of importance over time were not supported as no significant differences were found for either type of regret. The two measures of rehearsal differed significantly and people were more likely to think about their regrets than they were to share them with others, and in both cases rehearsal was greater for general than for specific regrets. Finally, as expected, ratings of personal responsibility were high and did not differ between types of regret.

### **5.3 Chapter discussion**

The principal aim of this study was to show that the patterns of impact found by Rajagopal et al. could be explained by the specific-general regret distinction, and in this regard the study has fulfilled its aim. Indeed, differences on the measures of breadth and depth of impact were more reliable for the memory-based distinction

than they were for agency. The failure to replicate these effects for agency may reflect some sensitivity to different methodologies, or perhaps framing effects. Participants in Rajagopal et al.'s studies were asked to list the consequences associated with regrets of action or inaction, and since regret type was a within subjects manipulation it is possible that participants adopted a comparative mindset, which might favour inactions, because it is easier to imagine or infer consequences for inaction than for actions. Also, since it has been shown that actions are more likely to be associated with immoral acts (Ritov & Baron, 1990; Spranca, Minsk, & Baron, 1991), being asked to think about the consequences of one's regrettable behaviours, which are likely to include feelings of guilt, shame or remorse, might actually inhibit the search for consequences of action regrets relative to inactions.

In the present study participants simply listed the consequences of each regret without explicit reference to either regret type or agency, and this might have encouraged a different kind of search. This is not to say that participants were unaware of or uninfluenced by agency or morality, but simply that the tension between these variables was not so pronounced or salient. So the finding that general regrets affect more domains and produce more consequences overall than specific regrets may better reflect the underlying structures and processes of autobiographical memory. A finding that is difficult to explain is the absence of an overall inaction effect, which is at odds with the findings of Studies 1,2 and 3 and with the regret literature generally. One possibility is that the face to face interview format has some effect on people's attributions of agency. Whereas the moral connotations associated with actions may inhibit the search for consequences, as suggested above, the opposite may have been the case when participants were asked directly whether their regrets were due to something they had done or failed to do. If,

as the studies of anticipated regret suggest, there is some sort of cultural expectation that favours action, then admitting to regrets of inaction may be perceived as more self-implicating.

Overall, people perceived the impact of their regrets as having been greater for themselves than for others, which supports previous research showing regret to be associated with self-focussed negative emotion (Mandel, 2003). Interestingly, this bias was only found for general regrets: specific regrets were not significantly self-focussed, which leads to the speculation that specific regrets represent a more varied mix and involve more other-focussed emotions such as guilt or remorse. Given this self-focus for perceived impact, it is not surprising that people were also more aware of regret's consequences for themselves than for others, although this awareness did not differ according to regret type.

The self-implicating nature of regret is also reflected in the high ratings of responsibility, which confirm previous findings showing regret to score highly on measures of 'self-agency' (Frijda et al. 1989) responsibility (Simonson, 1992; Zeelenberg, van Dijk, Manstead & van der Pligt 1998) and self-blame (Mandel, 2003).

Also of interest is the finding that regret was thought about more than it was talked about, regardless of regret type. It is perhaps not surprising that people appear reluctant to disclose their regrets to others given the traditionally negative perception of regret, its self-implicating character, and the strong associations it was shown to have in Study 5 with the moral emotions. This finding is consistent with the view expressed by Berntsen and Rubin (2004) and Rubin and Berntsen (2003) that fear of social censure discourages people from discussing negative events. It also echoes

research linking regret with rumination (Lecci et al., 1994, Jokisaari, 2003, 2004; Stewart & Vanderwater, 1999).

One striking finding that is incidental to the main investigation but which has implications for arguments about accessibility is the observation that 80% of the regrets provided in this study were general in nature, and a significant proportion of these (52%) concerned events spanning years. This suggests that long term general regrets are highly accessible. By contrast, eighty percent of specific regrets concerned events that were regretted within days, and a significant proportion of these (60%) concerned events that were regretted instantly.

Whether general regrets are also more numerous in absolute terms, it is impossible to say, and indeed, Rajagopal et al. concede that their measure of availability may in fact be just another measure of accessibility, since only accessible regrets are reported. Many participants in the present study expressed surprise at how many consequences they had been able to think of once they had begun to unpack them, and for many this was the first time they had thought about their regrets in this depth. Some also described having ‘discovered’ new regrets buried amid the consequences of the original regret, so the process of unpacking appears to be one in which the line between accessibility and availability is being constantly redrawn. It may be that given unlimited time, people could exhaust their list of life regrets. But the definition of availability used by Rajagopal et al. relies on the existence of a trace in memory for a given event, which means one could only include events that one remembers personally experiencing: this by definition would exclude many regrets incurred under the influence of alcohol, or regrets that arise when someone reveals to us that a comment we can’t even remember making had a lasting negative impact on their self-confidence.

Equally informative is the observation that only 12% of the regrets involved in the analysis concerned experiences from within a year of participation in the study. This finding is similar to that observed in Study 5, where equally small numbers of very recent regrets were recorded. It would appear that events from the past week do not readily spring to mind when people freely recall their life regrets.

Finally, in terms of the life domains perceived to have the greatest impact, it is revealing that the top five most consequential domains concern aspects of the self and relationships with other people. It is particularly noteworthy that the domain of character was the most consequential and also the only domain reported by all participants; thus supporting the view of regret as something with implications for the self. By contrast the achievement domains such as education and work were neither highly ranked, nor highly consequential and people listed approximately twice as many consequences for character than they did for education and work, and almost twice as many for self-development and family than for education. These results seem to suggest genuine qualitative differences between domains, with those involving harm to the self and other people being seen as having greater impact overall than those concerned with achievement. This finding is consistent with the results of Study 5, which showed that regrets involving harm to the self or others had stronger associations than did achievement regrets with emotions such as guilt, remorse and shame.

## **Chapter 6: General Discussion**

### **6.0 Chapter overview**

This final chapter has three main aims: (1) to summarise the main findings of the research reported in the thesis; (2) to contextualise the findings within the wider literature and consider their implications; and (3) to consider the limitations of the research and outline some future directions.

### **6.1 Summary of the main research aims and findings**

The research reported in the thesis addressed questions pertaining to the temporal pattern of regret by means of a memory-based distinction between regrets for specific and general events. This distinction was proposed as an alternative to the agency-based distinction between action and inaction regrets, which has been the dominant dimension of contrast in regret research. Throughout the thesis it has been argued that the specific-general regret distinction can account for many agency-based effects observed in regret research. Underlying this argument are four assumptions: (1) that the specific-general and action-inaction regret distinctions are underpinned by one structural dimension of event specificity; (2) that specific regrets can be equated with the specific negative memories studied by autobiographical memory researchers; (3) that many general regrets concern positive scripted events gone wrong; and (4) that general regrets tend to concern more distant events whereas specific regrets tend to concern events from the recent past.

*Studies 1 and 2* looked at the temporal pattern of specific and general autobiographical regrets in the context of the life script account of the reminiscence bump phenomenon. In both studies general regrets were more likely to be attributed



to inactions than to actions and they were more likely to concern experiences from the period of early adulthood than from elsewhere in the lifespan. Overall, regrets for distant experiences were more likely to be general than specific. By contrast, the experiences associated with specific regrets were more randomly distributed across the lifespan, and specific regrets showed patterns of recency similar to those typically found in autobiographical memory studies of negative memories. Regrets for specific events were as likely to concern actions as inactions. The content of people's regrets reflected patterns found in the wider literature, with regrets for experiences concerning family, intimate relationships (including marriage and parenting), education, work, character, and self-actualisation being the most frequently reported.

*Studies 3 – 4c* primarily considered the contribution of the life script to the content and temporal distribution of prospective regrets. Based on the assumption that the life script would be as important in determining the distribution of future regrets as it was in shaping the distributions of retrospective regrets in Studies 1 and 2, the novel prediction was made that a *preminiscence bump* in early adulthood would be found for the general anticipated regrets of young adults. In a series of four studies predominantly young adults living through the bump period described and dated the experiences either they themselves might regret in life (Studies 3 and 4a) or they described and dated experiences a peer (Study 4b) or an average person (Study 4c) might regret in life. By tapping people's intuitions about the regrets of others, the latter two studies were a direct attempt to abstract life scripts away from personal concerns specific to individual participants.

The main findings across Studies 4a-4c were that the anticipated regrets showed a pronounced preminiscence bump in the third decade, were predominantly

general in nature, were overwhelmingly associated with inaction, and were consistent in terms of content. Specific anticipated regrets were considerably fewer in number and tended to concern actions.

In Study 3 participants also described what they already regretted, which allowed for a comparison to be made between the regrets *from within the bump years*, and the regrets *about the bump years* provided by the older adults in Studies 1 and 2. This comparison revealed remarkable similarities in content. Bump age adults most frequently regretted experiences concerning education, family, intimate relationships, friends and the self, and older adults' regrets about the bump period concerned experiences in the same domains. In particular, almost all regrets concerning education and the self came from the bump period, along with half of work and intimate relationship regrets.

Study 5 applied the specific-general distinction to Gilovich et al.'s (1998) distinction between "hot", "wistful", and "despair-related" regrets, and extended their model by the inclusion of a cluster of "moral" emotions. The affective profiles they found for action and inaction regrets were replicated for specific and general regrets respectively, whereas analyses by agency provided only weak support for the Gilovich et al. findings. Study 5 also extended Berndsen et al.'s (2004) distinction between *intrapersonal* regret and *interpersonal* guilt by showing that within intrapersonal regrets a meaningful distinction could be made between two statistically independent categories of self-focussed regrets; those concerned with achievement and those involving other aspects of self-actualisation.

Study 6 examined the hypothesis that the impact of general regrets, as measured by life domains affected and consequences produced, would be greater than the impact of specific regrets because general regrets have a relatively broad,

temporally extended structure in the autobiographical memory knowledge base (Conway & Rubin, 1993). This hypothesis was contrasted with comparable claims made for action and inaction regrets by Rajagopal et al. (2005) using a similar operational definition of impact. The results supported the memory-based hypothesis: general regrets affected more domains, produced more consequences, and marginally more consequences per domain than did specific regrets. These findings were not replicated for agency and so did not support the Rajagopal et al. findings. Other findings were that awareness of the impact of regrettable experiences was greater for the self than for others. People were significantly more likely to think about their regrets than they were to share them with others, and regret was rated high on a measure of responsibility.

## **6.2 Implications: narrow and broad**

The studies in the thesis were directly or indirectly motivated by two observations from regret research. The first observation is that people regret their actions in the short term but over time it is their missed opportunities and failures to act that end up being regretted. The second observation is that regret surveys consistently show that these missed opportunities and failures to act tend to concern experiences in the domains of education, career, romance, parenting, the self, and leisure. Gilovich and Medvec (1995) offered the most comprehensive explanation for the first observation by providing evidence of cognitive and motivational factors that operate over time to dampen the effects of action regrets whilst at the same time making inaction regrets more troublesome and memorable. With regard to the second observation, Roesse and Summerville (2005) suggested that regret is most prevalent in those life domains that offer opportunities for future corrective action,

whereas Beike et al. (2009) argue the opposite, that regret arises from recognising that future opportunities to redeem regrets are no longer possible. The conclusion derived from the studies reported in the thesis is that a more integrated account of these two findings can be offered by models of autobiographical memory, which suggest that both observations might be mediated, at least in part, by the interaction between event structure and the life script.

Although many agency-based interpretations of regret's temporal pattern do recognise the role of memory processes, they fail to consider the more fundamental ways in which the mnemonic structure of action and inaction regrets influences how they are remembered and construed over time. Agency-based accounts that draw on surveys of older adults overlook the way that cultural factors like the life script bias retrospection in favour of the distant transitions of early adulthood. By the same token, explanations for why people regret some experiences more than others overlook the influence of normative expectations about what is deemed important and regret-worthy in life, and while there is much to recommend both the Roese and Summerville (2005) and Beike et al. (2009) accounts, a much simpler explanation is that people regret what is self-implicating and culturally important.

In the next section the specificity and agency distinctions will be considered more closely: in particular, the relationship between general and inaction regrets and between specific and action regrets. It will be considered whether the findings described in this thesis mean that the action-inaction distinction is totally subsumed by a distinction between general and specific regrets.

There then follows a discussion of the relationship between regret as an autobiographical memory and regret as a decision making phenomenon, and in a subsequent section consideration is given to the role of scripts in determining norms

for what people regret and thus, the content of their regrets. Finally, the implications of the results are considered in the context of the relationship between regret and other emotions.

### *6.2.1 The relationship between the distinctions*

#### *6.2.1.1 Factors that make general inactions*

Regrets for inaction become more frequent in the long run because they tend to concern general and therefore distant events. This simple but novel interpretation is consistent with models of autobiographical memory which show that event knowledge becomes more general with the passage of time (Conway & Pleydell-Pearce, 2000) and with theories showing that temporally distant events tend to be construed in abstract terms (Trope & Liberman, 2003). The interpretation is supported by the finding that inactions tend to be described in general terms and general regrets tend to concern more distant events on the whole. These findings echo findings elsewhere in the literature showing that inaction regrets tend to concern distant events (Wrosch & Heckhausen, 2002) and they are consistent with the observations in Gilovich and Medvec's (1994, Study 2) work showing that inactions viewed from a "distant retrospective standpoint" (p. 360) were more likely to be summaries of multiple instances of inaction.

As Gilovich et al. speculated, and as was demonstrated empirically in Studies 1 and 2, another factor that makes general inactions more prevalent in the long term is the emergent nature of their consequences, which often take years to be realised. Specific regrets on the other hand tend to concern events with instantly apparent consequences. Moreover, as the results of Study 6 show, general regrets have far reaching consequences and their impact is experienced in many areas of life.

Furthermore, people perceive these general regrets as having had a greater impact on themselves than on others, whereas this egocentric bias is not found for specific action regrets. Allied to this is the finding that people are more preoccupied with their general regrets, which are more likely than specific regrets to be rehearsed, so they are more salient in memory. It may be that that general regrets are easier to think and talk about than are specific regrets, as the latter are affectively “hotter” and more strongly associated with self-implicating moral emotions.

General regrets also appear to be more available to cognition, as is clear from the preponderance of general regrets reported across the studies. Between 59% and 80% of experienced regrets were general (the asymmetry was even more pronounced for prospective regrets, 85% of which were general) and the tendency to produce general responses is clearly very strong, as was evident in the two studies where regrets had to be recategorised. Although this tendency may pose practical problems for researchers, it is, as Barsalou (1988) discovered, a highly informative bias. Given that inaction regrets tend to be general in structure, it becomes easier to appreciate the extent of the inaction effect reported in studies of autobiographical regret, particularly those involving older adults. The Hattiangadi et al. (1995) data for example show that inactions outnumbered actions by more than four to one, and that does not include a category of ‘indeterminate regrets’ (those coded as ‘both’ or ‘neither’) which in the studies reported in the thesis were on average three times more likely to be general than specific. It would not be surprising to find similar patterns in surveys asking people to say what they would do if they had their lives to live over (DeGenoa, 1992; Hattiangadi et al., 1995; Kinnier & Metha, 1989; Landman & Manis, 1992; Landman et al., 1995) because as Kahneman (1995) has suggested, requests for regrets tend to elicit elaborative counterfactuals about how

life might have been better, which are likely to involve big changes of a general nature. In temporal construal terms (Trope & Liberman, 2003) such requests might be interpreted as an invitation to consider personal goals at the superordinate level, which would necessarily elicit ‘bigger picture’ construals of distant events.

Indeed, focussing on the ‘bigger picture’ and superordinate goals may be an automatic response to a request to describe what one regrets in life, because regret is evaluative in nature and so as Landman (1993) points out, a request for regrets is a request to *think*, to evaluate, to judge. As regret is also seen to be a valuable source of insight and sense making (Saffrey et al., 2007) it is likely that these broad, general level regrets are integral to processes of autobiographical reasoning (Bluck & Habermas, 2000). It is revealing that in Studies 5 and 6 only five to eight percent of regrets were reported as having occurred within a year of testing. This does tend to suggest that unless compelled by experimental instructions to do so, people do not naturally interpret requests for regret as requests to search memory for recent episodes in which they *experienced* regret. In fact the contrary seems to be the case; that regrets more often seem reasoned than recollected.

The greater availability of general (inaction) regrets may also partly explain why the action effect found in the scenario literature does not easily translate to ecological studies of autobiographical regrets: participants making judgements about fictitious characters in vignettes do not draw on the same structures and processes of autobiographical memory that are involved in the retrieval of their own autobiographical regrets.

From an autobiographical memory perspective the tendency to produce general regrets could be explained by factors that favour the retrieval of information at the general level. As a basic level category (Conway, 1992) general events

represent the maximum amount of information that can be processed with the minimum amount of cognitive effort, and the general event level is the preferred point of entry into the autobiographical memory knowledge base, making general events highly accessible (Conway & Bekerian, 1987; Reiser et al., 1985). Moreover, as previously stated, general events and lifetime periods are used extensively in organising the personal narrative (Barsalou, 1988; Bluck & Habermas, 2000; Conway & Pleydell-Pearce, 2000).

But it is possible that this tendency to produce general regrets may have a functional purpose. As was described in the introductory chapter, Conway and Pleydell-Pearce (2000) suggest that inhibitory mechanisms protect the self from the disruptive influence of negative memories by preventing their access beyond the general level of the autobiographical memory hierarchy. Recalling negative experiences by retrieving semantic rather than episodic detail is one way of creating psychological distance from emotionally threatening memories and it is assumed to occur naturally over time (Robinson & Clore, 2002,a,b). Moreover, people are inclined to adopt an objective third person perspective when remembering pasts that reflect unfavourably on their current view of themselves (Libby & Eibach, 2002), which would likely include many general, trait memories. So the tendency of regrets to become more general over time may decrease the pain of the regrettable events in our lives. Summarised experiences become semanticised autobiographical facts indexed by other semantic information (Conway, 1987), so someone presented with the semantic category cue ‘regret’ may bring to mind the autobiographical fact that they didn’t work hard enough at school, which they *know* without having to remember their schooldays or anything negative at all.



Byrne (2005) has suggested that natural ‘fault lines’ in the imagination determine the kinds of counterfactuals that people generate: the findings in this thesis suggest that similar fault lines in autobiographical memory determine the structure, and to a large extent the content, of the elaborative counterfactuals that make up people’s life regrets, as they are overwhelmingly general in structure and tend to concern distant inactions in the domains associated with early adulthood. This finding may turn out to be the most informative and theoretically challenging contribution of the thesis, as it seems to confirm Alfred North Whitehead’s observation that although we live our lives in detail ‘we think in generalities’. It also has implications for what can be inferred from regret surveys about what people actually regret, because the evidence suggests that regret surveys provide us with only a rather general picture.

#### *6.2.1.2 Factors that make short term specific actions*

Gilovich and Medvec (1995) suggested that action regrets tend to be short-lived because they prompt behavioural and psychological repair work: following regrettable actions people engage in compensatory behaviours, seek out the positive, and recruit other dissonance-reducing mechanisms to lessen the sting of negative outcomes. Whilst acknowledging the importance of these factors, there are other, more fundamental factors that serve to make regrettable actions short-lived in memory, and these are to do with mnemonic structure. Action regrets are short lived because they tend to concern specific events, and several factors contribute to the relatively poor retention of specific negative events over long time periods.

First of all, specific regrets are more likely to concern recent events, as demonstrated by the fine-grained recency analysis of Studies 1 and 2, which showed

that specific regrets are similar to negative memories in this regard. There were of course exceptions to this pattern and some specific events were retained over long time periods. One participant in his sixties for example regretted a decision taken fifty years earlier not to return to face exams after a difficult day at school. Events such as this, which turn out to have long term consequences, may be memorable for many years and may turn out to be 'self-defining' memories (Singer & Salovey, 1993); but the vast majority of specific regrets concerned events that were much more recent.

Another factor that doubtless contributes to specific actions being short-lived is that like other unpleasant events they are more quickly forgotten (Walker et al., 1997). Holmes (1970) suggested that the tension created by negative events is resolved naturally when their potential consequences fail to materialise, and this explanation seems especially likely in the case of action regrets. For example, students awaiting the results of their finals may be tormented for weeks by regrets for specific mistakes and poor performance in exams, imagining worse case scenarios and living in dread of the results. But when the results turn out not to be that bad, the regrets that loomed so ominously simply vanish.

The transitory nature of the affective experience itself ensures that the affective 'heat' of specific regrettable events diminishes relatively quickly and the episode itself will be remembered with less and less detail over very short time frames, as there is a greater reliance on abstract semantic knowledge (Robinson & Clore, 2002a,b). And as Taylor (1991) suggests, negative events mobilize biological, psychological, and social resources aimed at dampening the long term impact of these events, which is consistent with Gilovich and Medvec's (1995)

suggestion that action regrets are made less painful through dissonance-reducing and ameliorating mechanisms.

Finally, regrets for particularly vivid emotional events may be challenging to the view of the self, especially if they involve self-implicating emotions such as shame and guilt, so the protective inhibitory mechanisms of the self memory system (Conway & Pleydell-Pearce, 2000) may ensure that access to such disruptive memories is blocked. This may partly explain the relative paucity of specific regrets and why they are less likely to be talked about.

#### 6.2.2 *One distinction or two?*

A central aim of the research in the thesis has been to examine the relationship between the action/inaction and specific/general regret distinctions. The findings across the studies suggest some alignment between the distinctions, but also evidence suggesting they are not interchangeable. This may reflect genuine differences in the distinctions themselves, but it could also reflect different methodologies, as was speculated in the previous chapter: studies in which participants are required to focus on agency as the primary feature of their regrets may elicit the involvement of different reasoning and recollective processes. This must be taken into account when considering the findings, as it is important to recognise that agency was treated as a within-subjects variable in all of the studies in the thesis and so the findings concerning the overlap are correlational.

Whereas the relationship between inaction and general regrets seems strong, the relationship between specific and action regrets is less stable, because although specific regrets were as likely to be due to action as inaction, they were not as reliably associated with action as general regrets were with inaction. Also, in Study 2

agency interacted significantly with age group whereas regret type did not. Older participants were significantly more likely than younger participants to regret inaction, but the difference due to age in general regrets was non-significant.

The thesis advanced is that inaction comes to be regretted over time because autobiographical memories become more general over time and inaction regrets have a more general mnemonic structure. However, it is possible that at least some of the factors identified by Gilovich and Medvec (1995) work to make the action/inaction distinction more pronounced than the specific/general distinction. As these processes operate over extended time periods, the action/inaction distinction should be most pronounced in older participants, as was observed in Study 2 where the inaction effect was larger in the 60s group. Older participants, having less time in which to accomplish goals and aspirations, are more likely to be aware of things left undone, a possibility reflected in the assertion that reminiscence and life review bring “the resurgence of unresolved conflicts” (Butler, 1963, p. 66). Empirical support for this assertion is provided by Jokisaari’s (2003) observation that older people perceive their regrets as less likely to change and as being less under their control than do younger people. People in the midlife period still have the opportunity to transform their regrets of early adulthood by making behavioural corrections (Stewart & Vanderwater, 1999).

Landman (1987) suggests that while it may be ontologically or logically impossible to distinguish actions from inactions, the distinction is psychologically valid and Gilovich and Medvec (1995) take a similar view. Whilst acknowledging the psychological reality of the action-inaction distinction and its contribution to our understanding of regret, the conclusion here is that a memory-based alternative can overcome any problems of definition. As categories based on frequencies of discrete

phenomena, specific and general events *are* ontologically and logically distinct, and though the line between single and multiple instances of an experience may be psychologically difficult to distinguish, as Barsalou (1988) discovered and as was also found in Studies 1 and 3, a case of mistaken identity doesn't alter the identity of the mistaken object, or the possibility that it can be established (a single day is distinct from two or more days; one argument is a concrete experience distinct from the more abstract experience of arguing a lot).

It could of course be argued that people choose to act or not, whereas they don't choose to have specific or general memories. Many regrets do indeed stem from conscious decisions, but as has already been argued, many do not, and regret is something people can stumble or drift into because they often have no control over their circumstances or behaviour (Lowenstein, 1996). For example, an outburst of anger can override decision processes to produce a regretted action just as easily as years of apathy can paralyze decision processes and lead to regrettable inactions. While it may be true that people don't consciously choose the structure of the autobiographical memory knowledge base, there is evidence that emotional state and motivation can bias the type of information they attend to and later retrieve, (see Levine & Pizzaro, 2004). Depressed individuals for example are prone to overgeneral memories (Williams & Broadbent, 1986) while even sub-groups of anxious individuals may differ reliably in the specificity of the memories they retrieve (Wenzel, Pinna & Rubin, 2004). This is not to say that people consciously choose specific or general memories, but simply to caution against the assumption that regrets and memories can easily be distinguished on the basis of agency.

What we *can* do with memories which we *cannot* easily do with attributions of action or inaction however, is unpack and verify their contents using objective

criteria. The validity of externally derived memories for real events can be established (by someone other than the person doing the remembering or regretting) using sophisticated autobiographical memory methodologies such as those used by reality monitoring researchers to separate real and imagined events according to perceptual, contextual, spatial and temporal characteristics (Johnson et al., 1988). Attributions of action or inaction on the other hand rely on internally generated memories of thoughts and intentional states, and memory for thoughts is known to be less reliable than memory for real events (Conway et al., 1996). When referring to action and inaction regrets we typically mean their external consequences (the aftermath of an argument, the mediocre career resulting from a wasted education). But the psychological antecedents, insofar as we are aware of them at all, remain internal and subjective and are likely to be forgotten over time, making our past behaviours inexplicable, particularly our reasons for inaction (Gilovich & Medec, 1995). Regrettable actions often involve a failure to inhibit some impulse, or to *not do* something, but it is the act and its consequence we remember. Similarly, time wasted not doing X was time spent doing Y instead, but the former dominates our awareness. The interplay of conscious and unconscious processes makes the psychological origins of our behaviours difficult or impossible to establish.

The same problem of validation applies of course to regret in general, which is a subjective experience involving internal judgements and affective responses. We cannot validate regret itself but we can validate memories for the antecedent circumstances of regret. This has implications for issues of responsibility and learning, as is suggested by Mather, Shafir and Johnson (2000), who observed that people misremember past choices in a way that supports the choices they made.

### 6.2.3 *Regret, autobiographical memory and decision making*

The discussion of agency brings to the fore the contrast made in the introductory chapter between the traditional decision making approaches to regret, and the memory-based approach proposed in the thesis. Many conceptual points could be debated, but at a more practical level, much can be gained by looking at the content of people's regrets and the language they use to describe them. What comes out clearly from the regret descriptions is that contrary to what Zeelenberg and Pieters (2007) take as axiomatic, regret is not clearly the product of decisions, at least not in the sense of conscious, deliberated choices between options. In fact many regrets refer to dispositions ("*Being cautious and timid*"; "*That I am not strident enough*"; "*Not being more outgoing*") and seem more a lament for lost possible selves (King & Hicks, 2007) than for bad choices, because individuals expressing such regrets attribute the source of regret not to what they have or haven't done, but to who and what they are. For example, parents who regret the behaviour of their children ("*I regret that my son left his wife to live with a man; what could I have done?*") would not meet the criteria of a strictly decision-based view of regret, yet they may well feel partly responsible for the behaviour of their offspring and so feel they have failed in their role as parents.

These characterological regrets are frequent in other studies (Gilovich & Medvec, 1994; Hattiangadi et al., 1995) and this observation supports the argument made in the introductory chapter that much of what people end up regretting is the product of general patterns of behaviour, the residue of many forgotten instances when this or that inclination was followed. Indeed, Gilovich and Medvec (1995) themselves point out that the forgotten reasons for not acting, which make inaction inexplicable and unjustifiable in hindsight, become a kind of dispositional regret, as

people castigate themselves with accusations that they are “just too timid” or “too indecisive” (p. 388). In this regard it is revealing that throughout the studies in the thesis character was ranked highly as a source of real and anticipated regret, and in Study 6 character regrets were more consequential than regrets from any other domain.

Many regrets are of course attributed to specific decisions, but as is clear from the relative proportions of specific and general regrets found throughout the studies, it is far more common to find regrets for decisions described in general terms (“*Left the army too early*”; “*Regret studying medicine*”), and such descriptions reflect the evaluation of superordinate goals and a focus on the bigger picture. This is perhaps the point at which the decision-making and autobiographical memory approaches converge: clearly very many regrets do emanate from choices on some level, but with the passage of time the details of those choices are forgotten and what remains is the general feeling or the inference that at some point regrettable choices were (or must have been) made.

So the decision making approach, which has relied heavily on scenarios with clearly specified choices and outcomes, and which tends to deal with the short term, seems best suited to exposing the mechanisms by which regrets are produced, whereas the ecologically-orientated autobiographical memory approach seems best suited to showing how these outcomes are remembered over time and why some regrets are better remembered than others.

What also comes across from people’s regret descriptions is that whether they describe their regrets in terms of decisions or dispositions, they feel personally responsible for them. This was also clear from the responsibility ratings in Study 6, which were at the high end of the scale. It seems that people blame themselves not



only for the things they have done or failed to do, but for what they have become. The statement 'no choice, no regret' is an invitation to explore such matters further, because to bind regret so tightly to choice is to conclude that people have chosen their regrettable dispositions, in which case it might be time to stop asking people what they regret and time to start asking them why they chose to become poor husbands, underachievers or inadequate parents.

#### **6.2.4 The question of scripts**

##### *6.2.4.1 Norms for regret*

In considering whether there might be norms for regret a distinction must be made between the stimulus norms described by Kahneman and Miller (1986) and norms that represent socially and culturally shared expectations about patterns of behaviour, such as the norms that govern the life script. What is deemed normal or exceptional in the former sense is determined by the unique context created by a surprising event, whereas socially and culturally prescribed norms are probabilistic and so form a basis for predicting behaviour. That said, even a surprising event such as a car crash, whilst unique to that instance, will share features with car crashes in general, so in this sense normative information in memory will be used in the counterfactual reconstruction. Whether these two types of norms are categorically distinct or whether they represent ends of a continuum is an empirical question yet to be addressed, but they illustrate the essential difference between specific and general regrets, which is that the former are relatively idiosyncratic and unpredictable whereas the latter are not. *In general* it is possible to say what people will regret in life because general regrets, whether experienced or anticipated, involve elaborative counterfactuals/prefactuals that draw on schematic, scripted knowledge.

Two striking observations from Studies 3 – 4c support this argument; one concerning content and the other concerning agency. With regard to content, young people were consistent in their predictions about what they themselves, their peers and the average person would regret in life, and they were equally consistent in their estimates of when these regrettable experiences might occur in the lifespan. Furthermore, their expectations about what experiences would be regretted and where they would occur in the lifespan were consistent with what older adults had in fact experienced: the experiences of early adulthood were deemed a source of potential and actual regret for young and old respectively, and in both age groups there was an emphasis on experiences associated with family, education, intimate relationships, character, and the self. This degree of consistency strongly suggests the operation of an underlying norm that designates some experiences as more regret-worthy than others.

The second observation, which has implications for the current accounts of regret's temporal pattern, is that there is an overwhelming tendency to predict regrets of inaction: participants in all four studies (3 – 4c) expected themselves and others to regret inaction more than action. This implies either that people value action, or that they perceive that they *should* value action, which may indicate that action is morally weighted and carries stronger obligations. This observation is interesting because it suggests that action may be a culturally shared norm, and if this is the case then it is likely to exert a very strong influence on people's retrospective appraisals and may indicate that the regrets people supply in surveys say as much about what they feel they *ought* to regret as they say about what they actually do regret. The inaction effect in regret surveys may reflect people's realisation that they not only could have done more, but that they *should* have done more. Of course it could be that actions

and inactions are represented and understood differently and so until these issues are addressed empirically the interpretations offered here remain speculative.

As was mentioned in the introductory chapter, this bias towards action is implicit in the framing of questions in many regret surveys, which ask people to describe what they would *do* differently a second time around (DeGenoa, 1992; Kinnear and Metha, 1989; Stewart & Vanderwater, 1999), or to describe their missed opportunities (Landman et al., 1995) and regrets for things they regret not having done (Wrosch & Heckhausen, 2002). So far as it is possible to judge, there are no regret surveys in which participants are asked to describe what they would *not do* if they could live their lives again.

An overall inaction effect was only found in Studies 2 and 3 for experienced regrets, and so this argument is not strongly supported by the data for experienced regrets in this research programme. But the strength of the inaction effect in the studies of prospective regrets, and in the wider literature strongly supports the view that people value action more than inaction.

#### *6.2.4.2 Content*

Although the main focus of the thesis has been on regret's structural properties, regret content has also been central to the interpretation of most of the findings. Indeed, the first two studies of experienced regret were motivated by observations about regret content, as were the four studies of anticipated regret. For experienced regrets the ranking of life domains has been broadly consistent with Roese and Summerville's (2005) meta-analysis, although there has been a greater emphasis on regrets concerning family and intimate relationships and much less on education. In Studies 1 and 2 participants in their sixties reported twice as many

family regrets as they did education regrets, whereas for people in their forties family and education regrets were almost equally frequent. In Study 5 work and family were both more than twice as frequently regretted as education, and in Study 6, education ranked only about joint sixth with work. Education regrets were also considerably less consequential than were regrets of character, family, intimate relationships and self actualisation. These differences may be partly due to the fact that many of the studies in Roese and Summerville's meta-analysis asked participants to say what they would do differently if they could live their lives again, which is not the same as asking them what they actually regret. Education is deemed important in most societies, for reasons already explained, so it is likely to be one of the first things that comes to mind when people are asked to say what they would do differently a second time around.

The rankings found in the present studies, and in the Roese and Summerville meta-analysis are consistent with life script accounts of autobiographical memory in that the most commonly regretted domains include many of the transitional and consequential experiences of early adulthood. This was also clear in the ranking of anticipated regrets (Studies 3 – 4c) which showed family at the top of the list, followed by intimate relationships/work jointly, travel, relationships (general), education, then character and self-actualisation. These domains are seen as central and formative to the period of early adulthood (Elnick et al., 1999) and reflect important, culturally timetabled transitions, so it would be fair to say that people regret what their culture deems regret-worthy and important.

Only regrets of character were reported by all participants in Study 6 and these regrets were deemed to have had the most impact. The related domain of self-development was the next most frequently reported source of regret and what is

interesting about these two domains is that they had proportionally more positive consequences (37% and 40% respectively) than did interpersonal regrets concerning family and intimate relationships, which had 26% and 27% of positive consequences respectively. These findings resonate with the notion of regret as a bringer of insight (Saffrey et al., 2008) and are entirely consistent with functional models of regret (Roese, 2005; Zeelenberg, 1999; Zeelenberg & Pieters, 2007).

There were one or two differences between age groups, most notably in the domain of travel, which was a frequently anticipated regret of young adults (ranking between third and fourth across the studies), whereas for adults over forty it was near the bottom of their list of experienced regrets. In Study 5 there were no regrets at all concerning travel and in Study 6, travel was the least consequential of all domains. It is difficult to know whether these findings mean that travel means different things to different age cohorts, whether it is more important in prospect than in hindsight, or whether people look forward to it so much that they make sure they get it out of their system before reaching late adulthood.

#### *6.2.4.3 Regret and other emotions*

At the start of this thesis regret was defined as a counterfactual *emotion* and the notion that regret is a cognitive emotion rather than an emotional cognition goes more or less unquestioned by regret researchers (see Landman, 1993). However, it was also noted that some emotion researchers (Sabini & Silver, 2005) do not consider regret to be a discrete emotion at all but see it as a judgement (that something is regrettable) rooted in other emotions. The research reported in the thesis has only partially addressed this issue, but the results of Study 5 do suggest that regret is a multifaceted construct with a highly variable affective complexion.

The same study also suggests that regrets fall into two broad categories: those related to achievement and those associated with the self and other people.

Achievement regrets were experienced with less intensity than were self-actualisation and other-focussed regrets, and achievement regrets were also less likely than self-actualisation or other-focussed regrets to be associated with the moral emotions. Achievement regrets have been associated with dissatisfaction, whereas self-related regrets have been associated with depression (Jokisaari, 2004), so there seems to be a distinction between regrets for lost opportunities to *do* better in the world, and regrets for lost opportunities to *be* better in the world. The results of Study 6 support this view by showing that the four most consequential domains were those concerned with the self (character and self-development) or with others (family and intimate relationships), whereas achievement domains such as work and education were deemed to be considerably less consequential.

It is worth noting that in Study 5 sadness was the most highly rated emotion across the clusters, and yet statistically it was also the least reliable, suggesting that sadness always accompanies regret but is not clearly associated with the other emotions that also accompany regret. Recall that Landman (1993) considered regret to be “a more or less painful cognitive and emotional state of feeling *sorry* (emphasis added), which implies sadness, but also possibly some guilt or shame. The lexicographical definitions also associate regret with distress or longing for something lost (OED, 1991) or with “a sense of loss or feeling of having done wrong” (Chambers, 1998), which suggests that regret has at least two distinct causes; loss and wrongdoing. This view is consistent with some cognitive approaches to emotion which show loss to be a core feature of sadness, and self-blame to be the core feature of guilt (Smith & Lazarus, 1993). It may be then that two broad

categories of regret might be those of a pragmatic nature to do with lost opportunities, and those that reflect on the character through interpersonal or intrapersonal wrongdoing.

Another revealing finding of Study 6 was that regrets concerning family and intimate relationships had higher ratios of negative to positive consequences than did self-related or achievement domains. This may reflect an important qualitative difference between regrets that are relatively private versus those of a shared nature, which from a memory perspective is quite interesting. Regrets involving other people often involve the knowledge that someone else is aware of our transgressions and this knowledge is uncomfortable. Indeed, the judgement of others is what defines the “self-conscious” emotions of guilt and shame. People share our memories, they embody them, and they can hold us to account, either directly or through their influence on memory by way of our conscience. For this reason they may be experienced more negatively.

Landman (1993) acknowledges that regret can be “more a matter of ‘cool’ cognitive assessment than of ‘warm’ emotional reactivity” (p. 37) and many regrets appear to be expressed rather matter-of-factly (“*I regret not making more of my education*”; “*I shouldn’t have left the navy*”). Whether such regrets are accompanied by emotion or not it is impossible to judge, but it is not difficult to imagine: in fact it is very easy to think of things one regrets without feeling. Tulving’s (1985) phenomenological distinction between things we remember and things we know ‘on some other basis’ certainly supports the possibility that there might be a kind of *semantic regret*. Although this possibility can only be inferred from descriptions in the present research, it is certainly something that could easily be addressed using imaging or physiological methodologies and it might help resolve the issue of

whether or when regret is an emotion, and what makes it unique among related emotions and constructs. Such an approach would also be applicable to the study of anticipated regret, which can be an equally semantic evaluation, or may involve the vivid ‘pre-experiencing’ of an emotional response.”

### **6.3 Limitations and future directions**

This final section starts by addressing some of the limitations of the conclusions that can be drawn based on the studies in the thesis, then goes on to suggest future directions for research emanating from the findings reported in the thesis.

One limitation in the conclusions that can be drawn from the studies presented here concerns the relationship between regret and memory. Although the findings overall support the view that specific regrets can be equated with specific negative memories, the absence of a control group means that this claim is not directly tested, even though the idiosyncratic nature of specific regrets and their temporal properties do strongly suggest that they are very similar to specific negative memories. The same limitation applies to general regrets, which clearly differ from general memories. This issue might be addressed by studies involving direct comparisons between regrets and memories of both types. This could involve using the temporal dating paradigm common in word-cue studies and the Remember/Know paradigms described in Chapter 1. Specific regrets would be expected to share many of the characteristics of negative memories, such as the non-scripted temporal distribution and recency component already demonstrated in the thesis, as well as the recollective experience and accompanying imagery, spatiotemporal information and so on.



General regrets would be expected to differ from general negative memories in that the former has a relatively scripted temporal distribution, whereas this would not be expected for general negative memories, although both would tend to concern relatively distant events and both would be ‘known’ more than ‘remembered’.

Another limitation of the studies is that they do not unambiguously suggest a mechanism for the preminiscence bump observed in Studies 3-4c. The displacement of the bump for general regrets suggested a tension between the life script and temporal construal accounts, making it difficult to assess the relative contributions of these two mechanisms. The distribution of general anticipated regrets is broadly consistent with the life script argument that important culturally timetabled transitions occur in early adulthood, but the life script does not accommodate the displacement of the bump forwards in time. Temporal construal on the other hand predicts such displacement, but it predicts a more pronounced displacement than was actually observed, so it appears that construal mechanisms push general regrets into the distance while the life script anchors them to early adulthood. One way of overcoming this problem would be to run studies similar in design to Studies 3 – 4c, but instead of describing and dating regrets, participants would simply describe and date the negative experiences they themselves, or another person might have encountered by the time they reached older age. Whereas the life script predicts that general regrets concern experiences from early adulthood, it would not predict a bump for negative experiences of a general nature, which would be expected to cluster in the more distant future. Similarly, to explore whether Studies 3 – 4c are uniquely about regret experiences it would be instructive to ask people to anticipate and date things that might go wrong in their lives, or things they expect to feel disappointed about.

A limitation which these studies share with almost all other studies of regret is a reliance on somewhat simplistic and limiting definitions, which are either created by the researchers themselves or by people's own understanding of what emotion labels mean. As Roese, Summerville and Fessel (2007) have pointed out, this leads to problems of circularity, in that researchers produce findings that support their definitions, but which do not necessarily reflect the reality of the phenomenon being studied. One way around this might be the inclusion of more discriminating definitions and measures of regret, such as the psychometric and phenomenological instruments used in emotion research.

A more general limitation concerns the nature of postal surveys and self-report questionnaires. With return rates of between 21% (Study 1) and 30% (Study 3) many people clearly chose not to participate in the studies. Whether this reflects aversion to the topic, aversion to filling in questionnaires generally, forgetfulness or unfulfilled good intentions can only be conjectured. Several people approached directly by the researcher claimed either not to have any regrets, or not to 'do' regret, which may or may not be the same thing. The response rates might also reflect the findings of Study 6 that people prefer to think about their regrets than to share them with others. Self-report surveys could be criticised for favouring sanitized regrets or "pleasantly sad fantasies" (Kahneman, 1995), but it must also be noted that the anonymity of the survey method does allow people to divulge regrets of a very personal nature, which many did.

So what of future directions? The absence of temporal manipulations in the studies means that some claims made in the literature about the characteristics of recent and distant regrets were not directly tested. It would be particularly informative to examine more closely the structure and phenomenological

characteristics of regrets from the past week and those from the whole lifespan, as it is highly likely that regrets from the past week would be recollectively retrieved episodic memories, whereas entire lifespan regrets, as the results of the studies in the thesis suggest, are more general and reasoned.

Another area for future research might concern regret accessibility. The greater accessibility/availability of general regrets is inferred from the findings but is not assessed directly. That general events are more readily retrieved is amply demonstrated by the predominance of general regrets for both past and future events, but as compelling as these findings are, they do not explicitly test accessibility. This could be achieved using autobiographical memory methodologies and reaction time studies to examine more closely the differential accessibility of specific and general regrets. If general regrets are more accessible than specific regrets, then they should produce shorter retrieval latencies. Such an approach would also make it possible to monitor any priming effects to see whether a person who produced a specific or general regret first was also then be primed to produce regrets of a similar type. Unfortunately because participants in the present studies retrieved and listed regrets at their leisure, there is no way of knowing the order in which their regrets came to mind. Such effects could be examined in both between and within-subject designs using retrieval times or time-constrained listing techniques.

More generally, the model presented in this thesis lends itself to the study of other emotions such as guilt, shame, remorse, joy and relief, all of which might also be expected to involve more or less specific events, perhaps with predictable temporal characteristics.

The same distinction between specific and general representations might also be applied to counterfactual thinking more generally, as counterfactuals, like regrets

and memories, can be episodic or semantic in nature and this has implications for how they will be brought to mind. When someone one says for example, ‘If only my husband were more handsome’ what do they have in mind? Are they comparing two images? (how he was once with how he is now) and if so what kind of images? Or are they comparing an image and a proposition? The autobiographical memory framework supplies many methodologies that might help clarify what in fact the natural ‘fault lines’ of the counterfactualising imagination are and help us to answer such questions as why the action effect found in scenarios is not readily found in studies of autobiographical regret, or why action and inaction effects differ between scenarios in which the consequences are known, as in Kahneman and Tversky’s, (1982) investment scenario, or unknown as is the case in Gilovich and Medvec’s (1994, Study 4) student scenario. Existing accounts of these differences (Byrne & McEleney, 2000; Feeney & Handley, 2006 ) focus on the explicit versus implicit representation of consequences, but an autobiographical memory approach might also consider content effects and the extent to which people draw inferences based on their own life experiences and normative expectations. These questions have not been asked in the counterfactual thinking literature, but they would be easy enough to ask, either by having participants explain how they arrived at their judgements or by using ‘thinking aloud’ methodologies. One obvious direction suggested by the findings in the thesis is away from generality and towards greater specificity. This approach would require refining the broad distinction between specific and general regrets and it might entail unpacking general regrets to see what specific events and antecedents they are made of and what emotions they are associated with, or it might mean looking at specific regrets themselves in greater detail. It might also be useful to look within individual life domains to see exactly what makes some domains more

regrettable and consequential than others. A distinction might also be made between major and minor regrets, as it could be argued that regretting an argument with a loved one is not the same as regretting booking the 6.15 train. And while it may appear obvious why the former provides someone with information about “who they are and who they might have been”, it is less obvious what self knowledge is offered in the latter instance. Such inferences should be made with caution however, as the degree to which a regret is construed as minor or major will be determined by the context. Booking the 6.15 train may be a minor irritating regret at one point in the day, but if it results in arriving at the hospital too late to say goodbye to a dying relative, then it may become a major regret accompanied by guilt and remorse. Similarly, if the booking was made because it was the best option available at the time, then it may have no implications for the self, but if it is yet another reminder of one’s incompetence, it will have broader implications.

The benefit of a taxonomical approach to regret would be the clarification of the fuzzy distinctions between different types of regret and the different emotions with which regret is associated, but a more fine grained approach might also contribute to a better understanding of the relationship between regret, decisions, and memory.

#### **6.4. Conclusion**

This thesis represents an attempt to show how traditional decision making approaches to regret research can be complemented by viewing regret as a phenomenon of autobiographical memory, as the autobiographical memory framework allows for many existing aspects of regret research to be reinterpreted, or re-visited with different questions in mind. The main contribution of the thesis has

been to supply a functional distinction with which such questions can be addressed. The autobiographical memory framework also opens up many new possibilities for regret research, as the methodologies and approaches of the autobiographical memory paradigm provide access to aspects of regrettable phenomena that are beyond the grasp of traditional approaches. For example, the notion that there might be a kind of *semantic regret* could be examined within the context of the episodic-semantic distinction and the remember/know paradigm. This paradigm, which is widely used in clinical studies, would also open up the possibility of brain imaging studies (Wheeler et al., 1997) aimed at identifying the neural origins of different regret types and their dissociations.

However, as the discussion above makes clear, regret is not solely a phenomenon of autobiographical memory, but is also very clearly about the consequences of decision-making. It was suggested at the outset of the thesis that a slight shift of conceptual emphasis can yield an entirely novel perspective from which to view regret, and in this sense there is something of the Necker Cube illusion to the approach suggested in the thesis, as it involves being able to see regret as simultaneously an autobiographical memory and decision-making phenomenon. A major contribution of the thesis may be to provide a mechanism by which this perceptual shift can be realised, and perhaps the most promising synthesis of the two perspectives will be the application of autobiographical memory methodologies (and the specific-general distinction) to the study of regrettable decision-making itself. Finally, this work should also interest autobiographical memory researchers wishing to examine regret as a type of negative memory with distinctive temporal characteristics.

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## **APPENDIX A: MATERIALS**

A1	Studies 1 & 2	Cover sheet	290
A2	Study 1	Specific regret questionnaire sample	291
		General regret questionnaire sample	
A3	Study 2	Regret sheet and definitions	293
		Answer sheet	
		Answer sheet continued	
A4	Study 3	Experienced regret question sheets	296
		Experienced regret question sheets continued	
		Anticipated regret questionnaire	
A5	Studies 4a – 4c	Cover sheet	299
		Questionnaire (4a)	
		Questionnaire (4b)	
		Generate group questionnaire (4c)	
		Judge group questionnaire (4c)	
A6	Study 5	Cover sheet	304
		Specific regret questionnaire	
		General regret questionnaire	
		Emotion checklist	
A7	Study 6	Cover sheet	308
		Initial participant instructions	
		Preliminary answer slip (researcher)	
		Participant questionnaire	
		Consequences sheet	

A8	Coding instructions	313
	Studies 1 & 2	Specificity (experienced regret)
	Studies 3 – 4c	Specificity (imagined regrets)
	Studies 1, 2 & 3	Agency (experienced regrets)
	Studies 3 – 4c	Agency (imagined regrets)

## APPENDIX A1      Studies 1, 2 & 3: Cover sheet.

### About this study

Most people can think of things in their lives that they wish had or hadn't happened. These may be things they did or didn't do; bad decisions, unfulfilled ambitions, or something else. Such experiences often lead us to feel regret. In this study, we are interested in what people regret in their lives and when these regrets occur.

*(Study 3 modification: In this study, we are interested in what people regret in their lives, when these regrets occur, how strongly they feel about them, and how they expect to feel about them in the future).*

A simple way to think about regret is in terms of those experiences in your life that you wish had turned out differently. These may concern very important issues, or seem trivial to anyone but yourself: the important thing for the purpose of this study is that it should be something that didn't turn out as you wanted it to and which *caused/causes* you feelings of regret.

Your participation is entirely voluntary. Any information you provide will be completely anonymous and confidential and seen only by the researcher and research supervisor. Your age, gender and level of education are the only personal identity details you will be asked to provide and no-one will be able to link these to the experiences you describe.

Please read the paragraph below then write down your age, gender, and the highest level of education you attained. Please tick the box provided to indicate that you consent to take part in this study.

I have read and understood the outline of this study and realise that my participation is voluntary and that I can withdraw at any point. I acknowledge that by completing and returning this questionnaire I am consenting to allow the information I supply to be used by the researcher in this study.

Age .....years

Gender: (please circle as appropriate)      Male / Female

Highest level of education .....

Consent agreed (please tick the box)

☐



## APPENDIX A2

### Study 1: Specific regret questionnaire

We would like you to think of up to 5 regrets from your life so far. Each regret should be *specific* in nature. This means that the regretted experience happened on particular day in a particular place and involved you personally. It doesn't matter whether you felt regret immediately after the event or because of things that happened later. What matters is that you can say when that regretted experience happened.

Using the spaces provided below, describe in one sentence each of the regretted experiences. Don't worry if you have fewer than 5 regrets

1.....  
.....  
.....  
.....

### Study 1: Specific regret question sheet.

Now think about the regrets you have described and for each one answer the corresponding question. The questions are the same for all regrets.

<b>REGRET 1</b>
-----------------

*How old were you at the time of the regretted experience?* .....yrs old

**THANK YOU**

### Study 1: General regret materials

We would like you to think of up to 5 regrets from your life so far. Each regret should be **general** in nature. This means that the regretted experience did not happen on a particular day in a particular place. It should be something that involved you personally. Although you could not put an exact date on such an experience, you could say which decade of your life it belonged to.

Using the spaces provided below, describe in one sentence each of the regretted experiences. Don't worry if you have fewer than 5 regrets.

1.....  
.....  
.....  
.....

### Study 1: General regret question sheet

Now think about the regrets you have described and for each one answer the corresponding question. The questions are the same for all regrets.

Regret 1
<ul style="list-style-type: none"><li>○ <i>How old were you when you became conscious of starting to regret the experience? .....yrs old</i></li><li>○ <i>Which decade of your life does the regretted experience come from? Please circle as appropriate</i></li></ul> <p><i>1<sup>st</sup> (0 - 9)   2<sup>nd</sup> (10-19)   3<sup>rd</sup> (20-29)   4<sup>th</sup> (30-39)   5<sup>th</sup> (40-49)   6<sup>th</sup> (50-59)   7<sup>th</sup> (60-69)</i></p>

THANK YOU

## APPENDIX A3      Study 2: Regret sheet

### REGRET SHEET

We would like you to look back on your life so far and think of the things you regret. Please use the spaces provided below to describe in one sentence each of the regretted experiences.

There are 5 spaces provided, but don't worry if you have fewer than 5 regrets.

It is important that each description corresponds to only one of the numbers on the left and doesn't run over into the next space.

1.....  
.....  
.....  
.....

## Study 2: Definitions

### *Definitions*

We would like you to think about the regrets you have described and decide whether they concern specific or general experiences. The following definitions should help you.

#### ***A Specific regret***

A regret caused either directly or indirectly by a specific experience involving you personally and which you can say happened at a particular time in a particular place. It may be something you regretted straight away, or something you came to regret because of things that happened later. The most important thing is that you can say when the regretted experience happened.

#### ***A General regret***

A regret that is not caused by a specific experience. For this type of experience you could not say that it happened in a particular place at a particular time, but you could say which decade of your life the regretted *experience* belonged to.

## Study 2: Answer sheet

### REGRET NUMBER 1

Please think about the regret you have described and decide whether it is specific or general, then answer either question A or B.

#### Specific Regret

##### Question A

- How old were you at the time of the regretted experience?  
.....yrs old

#### General Regret

##### Question B

1. How old were you when you became conscious of starting to regret the experience?  
.....yrs old
2. Which decade of your life does the regretted experience come from? Please circle as appropriate

1<sup>st</sup> (0 - 9)   2<sup>nd</sup> (10-19)   3<sup>rd</sup> (20-29)   4<sup>th</sup> (30-39)   5<sup>th</sup> (40-49)   6<sup>th</sup> (50-59)   7<sup>th</sup> (60-69)

The following questions should be answered regardless of whether your regret is specific or general. Please answer both questions C and D.

##### Question C

- Please use the scale provided to say how likely you think it is that this regret will persist to the end of your life

Not at all  
likely

Absolutely  
certain

0 1 2 3 4 5 6 7 8 9 10

#### Question D

- Now think about the feelings caused by the regretted experience. Using the scale provided, please circle the number that best describes how intense the regret...

(i)

*.....was at the time*

Very  
mild

Very  
intense

1 2 3 4 5 6 7 8 9 10

(ii)

*.....is now.*

Very  
mild

Very  
intense

1 2 3 4 5 6 7 8 9 10

(iii)

*....will be when you reach the end of your life* (Circle N/A if you answered '0' to question C above)

[N/A]

Very  
mild

Very  
intense

1 2 3 4 5 6 7 8 9 10

## APPENDIX A4

## Study 3: Experienced regret question sheet

### QUESTIONS

We would like you to refer to the regrets you have written down and to consider the following questions. *Please answer the questions that apply to the regret you have described.* The same questions are repeated for each individual regret.

### REGRET NUMBER 1

#### Question (A)

If the regret was *directly caused* by a specific experience, please answer the following question:

- How old were you at the time of the negative outcome to the experience you regret?

.....yrs old

#### Question (B)

If the regret concerns a specific experience but was *caused indirectly* by things that happened later, please answer the following questions:

- I. How old were you at the time of the (subsequently) regretted experience?

.....yrs old

- II. How old were you when subsequent events 'triggered' the feeling of regret?

.....yrs old

#### Question (C)

If the regret does not concern a specific experience, but something more general, please answer the following:

- I. How old were you when you were conscious of starting to regret the experience described?

.....yrs old

### **Question (D)**

*Please use the scale provided to say how likely you think it is that this regret will persist.....*

(i)

**10 years into the future** *Not at all  
likely*

*Absolutely  
certain*

0 1 2 3 4 5 6 7 8 9 10

(ii)

**to the end of your life**

*Not at all  
likely*

*Absolutely  
certain*

0 1 2 3 4 5 6 7 8 9 10

### **Question (E)**

Now think about the feelings caused by the regretted experience. Using the scale provided, please circle the number that best describes how intense the regret...

(i)

**.....was at the time**

*Very  
mild*

*Very  
intense*

1 2 3 4 5 6 7 8 9 10

(ii)

**.....is now.**

*Very  
mild*

*Very  
intense*

1 2 3 4 5 6 7 8 9 10

(iii)

**.....will be in 10 yrs time** [Circle N/A if you answered '0' to question D (i) above]

[N/A]

*Very  
mild*

*Very  
intense*

1 2 3 4 5 6 7 8 9 10

(iv)

**.....will be when you reach the end of your life** [Circle N/A if you answered '0' to question D (ii) above]

[N/A]

*Very  
mild*

*Very  
intense*

1 2 3 4 5 6 7 8 9 10

### Study 3: Anticipated regret sheet

### ***Anticipated regret***

We would like you to think about the life ahead of you and imagine the choices, goals, expectations and experiences you anticipate for the future. We would like you to think about how you might feel if the things you anticipate in your life don't turn out as planned. Which of these things are you likely to regret and when? Please try to imagine yourself in your 60's looking back on your life and use the spaces provided to describe the things you are likely to regret.

*Please describe in one sentence each of the experiences you anticipate regretting if things don't go to plan. There are 5 spaces provided, but don't worry if you can't think of 5 experiences. It is important however that each description corresponds to only one of the numbers on the left and doesn't run over into the next space.*

**1.**.....  
.....  
.....  
.....

### Study 3: Anticipated regret answer sheet

We would now like you to consider each of the experiences you anticipate regretting and to answer the following questions. *Please answer **both** questions for each anticipated regret.*

### Anticipated regret (1)

a) Please indicate when in the future the experience you anticipate regretting is likely to occur by saying how old you will be at that time.

.....yrs old

b) Please use the scale below and circle the number that best describes how likely you think it is that the anticipated regret will persist into old age (your 60's)

*Absolutely certain* *Not at all likely*

$$0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \quad 8 \quad 9 \quad 10$$



## **APPENDIX A5      Studies 4a – 4c: Cover Sheet**

### **About this study**

This study is concerned with establishing cultural norms related to certain types of experience. In particular it is concerned with identifying the kinds of experiences people expect to regret in life. Regret is the emotion people feel when things don't turn out as they wished them to and it may concern things they did or didn't do, bad decisions, unfulfilled ambitions, or something else.

#### **Study 4a**

You will be asked to imagine what things you are likely to regret when looking back at your life from the eve of your 70<sup>th</sup> birthday. Then you will be asked to estimate when in your life those regrettable experiences are likely to have occurred.

#### **Study 4b**

You will be asked to imagine what experiences a person is likely to regret when looking back at their life on the eve of their 70<sup>th</sup> birthday. Then you will be asked to estimate when in that person's life those regrettable experiences are likely to have occurred.

#### **Study 4c (Generate group)**

You will be asked to imagine what experiences a person is likely to regret when looking back at their life from the age of 70. Then you will be asked to estimate when in that person's life those regrettable experiences are likely to have occurred.

#### **Study 4c (Judge group)**

You will be presented with a list of experiences that a person is likely to regret when looking back at their life from the age of 70. Then you will be asked to estimate when in that person's life those regrettable experiences are likely to have occurred.

The study is anonymous and the only personal details you are asked to supply are age, sex, and whether English is your native language. Your participation is entirely voluntary and you are free to withdraw at any point.

Please supply the following details and then tick the consent box to indicate that your agreement to take part in this study.

**Age**                      .....years

**Sex :** (*please circle as appropriate*)    Male / Female

**Is English your first language?**                      Yes / No

**Consent agreed** (*please tick the box*)

☐

## Study 4a: Regret sheet

### **Regret sheet**

I would like you to think about the life you will have lived by the time you reach the eve of your 70<sup>th</sup> birthday. Think of all your goals and expectations, all the choices you will have made, and all the experiences you wanted out of life. Imagine yourself looking back across your whole life and how you might feel if things haven't worked out as planned. What things are you likely to regret? Please use the spaces provided to describe the things you are likely to regret by the time you reach the age of 70.

*Please describe in one sentence each of the experiences you can imagine you might regret in life. There are 5 spaces provided, but don't worry if you can't think of 5 experiences. It is important however that each description corresponds to only one of the numbers on the left and doesn't run over into the next space.*

1.....  
.....  
.....  
.....

## Study 4a: Dating sheet

### **REGRET DATING SHEET**

Please consider each of the anticipated experiences you have described. Imagine looking back from the eve of your 70<sup>th</sup> birthday. Try to estimate when in your life each of the *experiences* you think you might regret is likely to have occurred (not the feeling of regret, which may have occurred later). Circle the appropriate decade.

#### **REGRET 1**

*The regretted experience is likely to have occurred...*

- .in decade ..<sup>1</sup> (1-9)    <sup>2</sup> (10-19)    <sup>3</sup> (20-29)    <sup>4</sup> (30-39)    <sup>5</sup> (40-49)    <sup>6</sup> (50-59)  
                  <sup>7</sup> (60-69)

## Study 4b: Regret sheet

### Regret sheet

I would like you to think about the life that an average person who is your age today will have lived by the time they reach the eve of their 70<sup>th</sup> birthday. Think of all their goals and expectations, all the choices they will have made, and all the experiences they wanted out of life. Imagine that person looking back across their whole life and how they might feel if things haven't worked out as planned. What things are they likely to regret? Please use the spaces provided to describe the things that this person is likely to regret.

*Please describe in one sentence each of the experiences you imagine this person might regret in life. There are 5 spaces provided, but don't worry if you can't think of 5 experiences. It is important however that each description corresponds to only one of the numbers on the left and doesn't run over into the next space.*

1.....  
.....  
.....  
.....

## Study 4b: Dating sheet

### REGRET DATING SHEET

Please consider each of the experiences you have described and try to estimate when in the person's life *the regretted experience* is likely to have occurred (not the feeling of regret itself, which may have occurred later). Circle the appropriate decade.

#### REGRET 1

*The experience this person regrets would have happened.....*

- ...in decade .....<sup>1</sup> (1-9) <sup>2</sup> (10-19) <sup>3</sup> (20-29) <sup>4</sup> (30-39) <sup>5</sup> (40-49) <sup>6</sup> (50-59) <sup>7</sup> (60-69)

#### Study 4c: Regret sheet (Generate group)

##### **Regret sheet**

I would like you to think about the life that an average person who is your age today will have lived by the time they reach 70 years of age. Think of all their goals and expectations, all the choices they will have made, and all the experiences they wanted out of life. Imagine that person looking back across their whole life and how they might feel if things haven't worked out as planned. What things are they likely to regret? Please use the spaces provided to describe the things that this average 70 year old is likely to regret.

*Please describe in one sentence each of the experiences you imagine this average 70 year old might regret in life. There are 5 spaces provided, but don't worry if you can't think of 5 experiences. It is important however that each description corresponds to only one of the numbers on the left and doesn't run over into the next space.*

1.....  
.....  
.....  
.....

#### Study 4c: Dating sheet (Generate group)

##### **REGRET DATING SHEET**

Please consider each of the experiences you have described and try to estimate when in the person's life *the regretted experience* is likely to have occurred (not the feeling of regret itself, which may have occurred later). Circle the appropriate decade.

##### **REGRET 1**

*The experience this person regrets would have happened.....*

- ...in decade .....<sup>1</sup> (1-9) <sup>2</sup> (10-19) <sup>3</sup> (20-29) <sup>4</sup> (30-39) <sup>5</sup> (40-49) <sup>6</sup> (50-59) <sup>7</sup> (60-69)

### Study 4c: Dating list (Judge Group)

Below is a list of experiences a person might regret in life. Your task is to try and estimate when in that person's life the *regretted experience* is most likely to have occurred (not the feeling of regret, which may have occurred later). Use the following decades as a guide and date the experiences by writing the appropriate number in the 'Decade' column.

**Decades** <sup>(age)</sup>: **1** <sup>(1-9)</sup>   **2** <sup>(10-19)</sup>   **3** <sup>(20-29)</sup>   **4** <sup>(30-39)</sup>   **5** <sup>(40-49)</sup>   **6** <sup>(50-59)</sup>   **7** <sup>(60-70)</sup>

Regretted Experience	Decade
Not going to University/pursuing their desired career	
Not having enough children	
Not living a healthy lifestyle which has lead to bad health in later life	
Not doing enough for others, i.e. doing little for charity	
Not saving much money, resulting in a poor pension	
Having a drunken one-night stand with that really ugly person	
Not living life to the full	
Never going out with that gorgeous bloke	
Arguing constantly with your parents about stupid things	
Getting that tattoo	
Mistakes made in relationships	
Not working hard enough at school	
Not spending as much time with other people they love	
Not travelling enough	
Not pursuing a relationship	
Taking on a promotion without fully considering the negative consequences	
Spending too much time working	
Arguments with someone with whom they are close	
Not putting in enough commitment	
Failed relationships	
A job they don't like	
They may wish they had married someone else	
They may wish they had taken more risks and adventures	
They may wish they had spent more time with family and friends	
They may wish they had looked after themselves better in their youth, e.g., not smoked	
Worrying too much about what other people think of them, worrying about their physical appearance. When you look back at 70 you perhaps wish you still looked like that and see photos and wonder what on earth you were so worked up about	
Some may stay with their partner in an unhappy relationship so as not to disrupt the peace / cause hassle. Perhaps there was someone else they always wondered about but never dared pursue it	

**APPENDIX A6      Study 5: Cover sheet**

**About this study**

This study is concerned with how people think and feel about the experience of regret. Regret is the emotion we experience when we think about things that didn't turn out as we wanted them to. It may be experienced in a variety of ways and may concern a wide range of experiences. Regret may focus on a single moment in the past, or may concern something spanning days or decades.

Your participation is entirely voluntary and you are free to withdraw at any point. Should you choose to participate you will be asked to describe something that you regret and then answer questions related to that regret.

Your responses will be anonymous and your age, sex and level of education are the only personal identity details you provide, and no-one will be able to link these to the experience(s) you describe.

Please read the paragraph below then write down your age, sex, and the highest level of education you have attained. Please tick the box provided to indicate that you consent to take part in this study.

I have read and understood the outline of this study and realise that my participation is voluntary and that I can withdraw at any point. I acknowledge that by participating in the study I am consenting to allow the information I supply to be used by the researcher.

**Age**                      .....years

**Sex:** (*please circle as appropriate*)    Male / Female

**Highest level of education**                      .....

**Consent agreed** (*please tick the box*)

☐

### Study 5: Specific regret sheet

I would like you to think of *something that you regret* which concerns a specific event that took place *within the course of a single day*. The experience can come from any part of your life and concern anything you did or didn't do, anything you said (or failed to say), any choices, decisions, or missed opportunities you wish had turned out differently.

Please use the space below to describe the thing you regret in one sentence, then answer the questions that follow.

.....  
.....  
.....  
.....

### Study 5: Specific regret question sheet

#### Question A

Does the regret you have described concern something you did, something you didn't do, both, or neither? Please tick.

Something I did ☐

Something I didn't do ☐

Both ☐

Neither ☐

#### Question B

To establish the history of this regret, please indicate which part of your life it stems from by saying how old you were at the time of the experience you regret.

*I was approximately.....yrs old*

#### Question C

Please indicate approximately how old you were when you realised that this was something you regretted.

*I was approximately.....years old*

### Study 5: General regret sheet

I would like you to think of *something that you regret* which is **general**, something that spans *any period longer than a single day*. The experience can come from any part of your life and concern anything you did or didn't do, anything you said (or failed to say), any choices, decisions, or missed opportunities you wish had turned out differently.

Please use the space below to describe the thing you regret in one sentence, then answer the questions that follow.

.....  
.....  
.....  
.....

### Study 5: General regret question sheet

#### Question A

Does the regret you have described concern something you did, something you didn't do, both, or neither? Please tick.

*Something I did* ☐

*Something I didn't do* ☐

*Both* ☐

*Neither* ☐

#### Question B

To establish the history of this regret, please indicate which part of your life it stems from by saying how old were you at the time of the experience you regret. If the experience spans more than one year of your life, say how old you were when you first had the opportunity to avoid the regret.

*I was approximately.....yrs old (use an age range if necessary)*

#### Question C

Please indicate approximately how old you were when you realised that this was something you regretted.

*I was approximately.....years old*



### Study 5: Emotion checklist (same for both types of regret)

I am interested in how you feel whenever you think of this regret. Below is a list of adjectives describing emotional states. Please consider each one and think about how much it applies to your feelings when recalling the regret you have described.

#### Question D

*Please indicate, by ticking the relevant column, how much this regret makes you feel;*

<i>Emotional state</i>	<i>Not at all 1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>A lot 5</i>
<i>Nostalgic</i>					
<i>Resentful</i>					
<i>Disillusioned</i>					
<i>Contemplative</i>					
<i>Angry</i>					
<i>Sentimental</i>					
<i>Guilty</i>					
<i>Empty</i>					
<i>Irritated</i>					
<i>Embarrassed</i>					
<i>Bored</i>					
<i>Ashamed</i>					
<i>Helpless</i>					
<i>Remorseful</i>					
<i>Wistful</i>					
<i>Confused</i>					
<i>Disgusted</i>					
<i>Unfulfilled</i>					
<i>Sad</i>					

**Thank You For Participating!**

## **APPENDIX A7      Study 6: Cover sheet**

### **About this study**

This is a study about regret and memory. In particular, it is about how people remember their regrettable life experiences.

You will be asked to think of experiences that you regret, but you will not be asked to disclose the content of your regrets. You will answer questions related to the experiences, but you won't have to disclose the experiences themselves.

The study takes the form of a semi-structured interview in which you will fill out a questionnaire and answer some questions. Nothing you say will be recorded and your age, gender and level of education are the only personal details you will be asked to disclose. Your participation is entirely voluntary and you are free to withdraw at any point.

Please read the paragraph below then write down your age, gender, and the highest level of education you attained. Please tick the box provided to indicate that you consent to take part in this study.

I have read and understood the outline of this study and realise that my participation is voluntary and that I can withdraw at any point. I acknowledge that by participating in the study I am consenting to allow the information I supply to be used by the researcher.

**Age**                      .....years

**Gender:** (*please circle as appropriate*)      Male / Female

**Highest level of education**                      .....

**Consent agreed** (*please tick the box*)

☐

## Study 6: Initial instructions

### INSTRUCTIONS

I would like you to take some time to think about your life and to think of anything that you regret or have regretted in life. It can be something you did or didn't do, a missed opportunity, a bad decision, or an unfulfilled dream. It doesn't matter whether it seems trivial or important, so long as it is something that concerns you personally and which caused/causes you to feel regret.

Use the paper provided to write your regrets down. This is to help you remember the experiences and you can keep or destroy it when the session is over.

You will be given a questionnaire to fill in. There are no right or wrong answers to the questions, but it's very important that you answer them as accurately and truthfully as you can. I will go through the questionnaire with you to explain certain things.

## Study 6: Initial answer slip (used by the Researcher)

Participant:							
		Specific			General		
	Spec / Gen 0 / 1	Inst/Del 0 / 1	Ageat	I A B N 0 1 2 9	Ageat	Dec	I A B N 0 1 2 9
Reg 1							
Reg 2							
Reg 3							
Reg 4							
Reg 5							

## Study 6: Question sheet

### QUESTION SHEET

#### Question 1

a) How important to your life <u>at the time</u> was the thing that you regret?						
Not at all important						Very
1	2	3	4	5	6	7
-----						
b) How important to your life <u>now</u> is the thing that you regret?						
Not at all important						Very
1	2	3	4	5	6	7

#### Question 2

c) How much impact has the thing that you regret had on your life?						
No impact at all			Moderate impact			Huge impact
1	2	3	4	5	6	7
-----						
d) As far as you can judge, how much impact has the thing that you regret had on the lives of other people?						
No impact at all			Moderate impact			Huge impact
1	2	3	4	5	6	7

### Question 3

c) <i>I have thought about this regret</i>						
<i>Never before now</i>			<i>Occasionally</i>			
<i>Frequently</i>						
1	2	3	4	5	6	7
-----						
d) <i>I have talked about this regret to other people</i>						
<i>Never</i>			<i>Occasionally</i>		<i>Frequently</i>	
1	2	3	4	5	6	7

### Question 4

c) <i>At the time of the thing that you regret, how aware were you of the consequences <u>for you personally</u>?</i>						
<i>Not at all aware</i>			<i>Somewhat aware</i>		<i>Very aware</i>	
1	2	3	4	5	6	7
-----						
d) <i>At the time of the thing that you regret, how aware were you of the consequences <u>for other people</u>?</i>						
<i>Not at all aware</i>			<i>Somewhat aware</i>		<i>Very aware</i>	
1	2	3	4	5	6	7

### Question 5

<i>How personally responsible do you feel for the thing that you regret?</i>						
<i>Not at all responsible</i>			<i>Somewhat responsible</i>			
<i>Totally responsible</i>						
1	2	3	4	5	6	7

## Study 6: Consequences sheet

I would like you to choose from the list below those areas of your life which have been affected by the thing that you regret.

You can tick as many as necessary.

For each area of your life that has been affected, please try to estimate the number of positive and negative consequences that have resulted from the thing that you regret.

Use the scrap paper provided to list all the consequences and then add them up to give a total for each separate area.

Area of life	Affected ( ✓ )	Number of consequences	
		Positive	Negative
Family			
Intimate relationships (marriage, lovers etc)			
Friendships			
Education			
Work			
Hobbies			
Travel			
Character / Personality			
Location (where you live/work)			
Material well-being (money, property, possessions etc)			
Health			
Self-development			

## APPENDIX A8      CODING INSTRUCTIONS

### Studies 1 & 2: Specificity (experienced regrets)

#### Definitions and Criteria

Your job is to read each description and decide whether it concerns a specific or general event. Below are the criteria for inclusion in either category.

##### Specific

- *Any discrete event, or any experience that could have happened on a specific day in a specific location.*
- *Any experience that might involve a choice or decision made at a specific moment in time.*

##### General

- *Anything that is not specific according to the criteria above: something that could not happen on a specific day in a specific location.*
- *Any regret that explicitly refers to repeated events, or summarised experiences.*
- *Any regret that necessarily implies repeated or extended events and could only happen over time.*

You should not try to second guess what the person is thinking. You should try to establish **beyond reasonable doubt** what is possible given the description. If you are unsure, it might help to think of some of your own experiences, as there is often a big gap between how we think about something and how we describe it in words to others.

### Studies 3 – 4c: Specificity (imagined regrets)

#### DEFINITIONS AND CRITERIA

The experiences described were produced by undergraduates and they concern **imagined** regrets.

Your job is to read each description and decide whether it concerns a specific or general event. Below are the criteria for inclusion in either category.

##### Specific

- *Any discrete event, or any experience that could be expected to happen on a specific day in a specific location.*
- *Any experience that might involve a choice or decision made at a specific moment in time.*

##### General

- *Anything that is not specific according to the criteria above: something that could not happen on a specific day in a specific location.*
- *Any regret that explicitly refers to repeated events, or summarised experiences.*
- *Any regret that necessarily implies repeated or extended events and could only happen over time.*

You should not try to second guess what the person is thinking. You should try to establish **beyond reasonable doubt** what is possible given the description. If you are unsure, it might help to think of some of your own experiences, as there is often a big gap between how we think about something and how we describe it in words to others.



### **Studies 1, 2 & 3: Agency (experienced regrets)**

#### **CODING INSTRUCTIONS**

Read each description and decide whether the regret described concerns something that the person feels was the result of something they did (an action), something they didn't do (an inaction), both something they did and didn't do, or neither an action nor inaction. Below are the codes you should enter into the appropriate column, along with some definitions to help you decide:

Inaction	= 0	Any regret that stems from something a person hasn't done or said. It can be explicitly stated or implied in the description.
Action	= 1	Any regret that stems from something the person has done or said. Again, it can be explicit or implied.
Both	= 2	Where the description includes explicit reference to both action and inaction (e.g. "Doing/Not doing X instead of Y") or where both action and inaction are implied (If I hadn't gone to X, I could have gone to Y etc)
Neither	= 9	Regret attributed to something another person has done, or to something that is beyond human agency. Regrets of character ('being X or Y'); Any regrets where the description is vague, or where none of the other criteria apply

### Studies 3 – 4c: Agency (imagined regrets)

#### CODING INSTRUCTIONS

The experiences described were produced by undergraduates and they concern **imagined** regrets that people are likely to have experienced in the course of their lives by the time they reach old age.

Read each description and decide whether it refers to something that the person is expected to have done (an action), something they are expected not to have done (an inaction), both an action and an inaction, or neither an action nor inaction. Below are the codes you should enter into the appropriate column, along with some definitions to help you decide:

Inaction	= 0	Any regret that stems from something a person hasn't done or said. It can be explicitly stated or implied in the description.
Action	= 1	Any regret that stems from something the person has done or said. Again, it can be explicit or implied.
Both	= 2	Where the description includes explicit reference to both action and inaction (e.g. "Doing/Not doing X instead of Y") or where both action and inaction are implied (If I hadn't gone to X, I could have gone to Y etc)
Neither	= 9	Regret attributed to something another person has done, or to something that is beyond human agency. Regrets of character ('being X or Y'); Any regrets where the description is vague, or where none of the other criteria apply

## APPENDIX B: TABLES OF UNREPORTED STATISTICS

<b>B1</b>	<b>Study 1</b>	<b>319</b>
	Table 1	Descriptive statistics for the distribution of the original and recategorised specific and general regrets
	Table 2	Original responses: specific regret single sample t test
	Table 3	Original responses: general regret single sample t test
	Table 4	Recategorised responses: specific regret single sample t test
	Table 5	Recategorised responses: general regret single sample t test
<b>B2</b>	<b>Study 2</b>	<b>320</b>
	Table 6	60s group: descriptive statistics for the distribution of combined, specific and general regrets
	Table 7	40s group: descriptive statistics for the distribution of combined, specific and general regrets
<b>B3</b>	<b>Studies 3 – 4c</b>	<b>321</b>
	Table 8	Study 3: descriptive statistics for the distribution of participants' own anticipated regrets
	Table 9	Study 4a: descriptive statistics for the distribution of participants' own anticipated regrets
	Table 10	Study 4b: descriptive statistics for the distribution of regrets predicted for a peer
	Table 11	Study 4c: descriptive statistics for the distribution of regrets predicted for an average person

<b>B4</b>	<b>Study 5</b>	324
	Table 12	Filler cluster reliability statistics
	Table 13	Correlations between the filler cluster and target clusters
<b>B5</b>	<b>Study 6</b>	325
	Table 14	Time elapsed for specific regrets: single sample t test

## APPENDIX B1 Study 1

**Table 1** Descriptive statistics for the original and recategorised responses for specific and general regrets, with frequencies, mean proportions and standard deviations

	Original responses						Recategorised responses					
	Specific			General			Specific			General		
	(N = 36)			(N = 39)			(N = 30)			(N = 38)		
Decade	<i>f</i>	<i>M</i>	<i>SD</i>	<i>f</i>	<i>M</i>	<i>SD</i>	<i>f</i>	<i>M</i>	<i>SD</i>	<i>f</i>	<i>M</i>	<i>SD</i>
0 – 9	3	.01	.06	0	---	---	2	.02	.07	0	--	--
10 – 19	14	.11	.15	38	.27	.23	7	.10	.22	35	.30	.23
20 – 29	25	.23	.24	38	.27	.27	11	.21	.31	33	.28	.27
30 – 39	16	.13	.16	20	.15	.19	7	.09	.21	16	.14	.23
40 – 49	12	.11	.19	10	.07	.12	6	.08	.20	9	.08	.18
50 – 59	24	.21	.24	17	.13	.20	10	.19	.32	12	.11	.21
60 - 69	21	.19	.24	15	.11	.12	14	.31	.36	12	.09	.13
	<i>115</i>			<i>138</i>			<i>57</i>			<i>117</i>		

**Table 2** Original responses: specific regrets single sample t test

Decade	<i>M</i>	<i>SD</i>	<i>M diff</i>	<i>t</i>	<i>df</i>	<i>p</i>
2	.11	.15	-.05	-2.24	35	.03
3	.23	.24	.07	1.63	35	.11
4	.13	.16	-.03	-1.33	35	.19
5	.11	.19	-.05	-1.79	35	.08
6	.21	.24	.04	.97	35	.34
7	.19	.24	.04	.84	35	.41

Test value = .0166

**Table 3** Original responses: general regrets single sample t test

<b>Decade</b>	<b>M</b>	<b>SD</b>	<b>M diff</b>	<b>t</b>	<b>df</b>	<b>p</b>
2	.27	.23	.11	2.76	38	.01
3	.27	.27	.12	2.72	38	.01
4	.15	.19	-.01	-.62	38	.54
5	.07	.12	-.09	-5.33	38	.00
6	.13	.20	-.03	-1.20	38	.24
7	.11	.12	-.05	-2.91	38	.01

Test value = .0166

**Table 4** Recategorised responses: specific regrets single sample t test

<b>Decade</b>	<b>M</b>	<b>SD</b>	<b>M diff</b>	<b>t</b>	<b>df</b>	<b>p</b>
2	.10	.22	-.06	-1.65	29	.11
3	.21	.31	.05	.81	29	.42
4	.09	.21	-.07	-1.97	29	.06
5	.08	.20	-.08	-2.26	29	.03
6	.19	.32	.03	.44	29	.66
7	.31	.36	.14	2.10	29	.04

Test value = .0166

**Table 5** Recategorised responses: general regrets single sample t test

<b>Decade</b>	<b>M</b>	<b>SD</b>	<b>M diff</b>	<b>t</b>	<b>df</b>	<b>p</b>
2	.29	.28	.11	2.85	37	.01
3	.27	.23	.13	2.82	37	.01
4	.14	.23	-.02	-.58	37	.56
5	.08	.18	-.08	-2.86	37	.01
6	.10	.21	-.06	-1.77	37	.09
7	.09	.13	-.06	-3.18	37	.01

Test value = .0166

## APPENDIX B2      Study 2

**Table 6      60s Group: descriptive statistics for the distribution of combined, specific and general regrets, with frequencies, mean proportions and standard deviations ( $N = 30$ )**

<b>Decade</b>	<b>Combined</b>			<b>Specific</b>			<b>General</b>		
	<i>f</i>	<b>M</b>	<i>SD</i>	<i>f</i>	<b>M</b>	<i>SD</i>	<i>f</i>	<b>M</b>	<i>SD</i>
0- 9	3	<b>.02</b>	<i>.09</i>	0	--	--	3	<b>.02</b>	<i>.09</i>
10-19	17	<b>.16</b>	<i>.19</i>	1	<b>.01</b>	<i>.08</i>	16	<b>.15</b>	<i>.18</i>
20-29	27	<b>.29</b>	<i>.28</i>	8	<b>.10</b>	<i>.21</i>	19	<b>.19</b>	<i>.26</i>
30-39	10	<b>.10</b>	<i>.15</i>	3	<b>.03</b>	<i>.10</i>	7	<b>.07</b>	<i>.13</i>
40-49	14	<b>.15</b>	<i>.24</i>	6	<b>.06</b>	<i>.17</i>	8	<b>.09</b>	<i>.19</i>
50-59	12	<b>.11</b>	<i>.21</i>	3	<b>.04</b>	<i>.15</i>	9	<b>.07</b>	<i>.15</i>
60-69	16	<b>.17</b>	<i>.12</i>	10	<b>.11</b>	<i>.11</i>	6	<b>.06</b>	<i>.07</i>
<b>Total</b>	<b>99</b>			<b>31</b>			<b>68</b>		

**Table 7      40s Group: descriptive statistics for the distribution of combined, specific, and general regrets, with frequencies, mean proportions and standard deviations ( $N = 41$ )**

<b>Decade</b>	<b>Combined</b>			<b>Specific</b>			<b>General</b>		
	<i>f</i>	<b>M</b>	<i>SD</i>	<i>f</i>	<b>M</b>	<i>SD</i>	<i>f</i>	<b>M</b>	<i>SD</i>
0- 9	2	<b>.01</b>	<i>.06</i>	1	<b>.01</b>	<i>.05</i>	1	<b>.01</b>	<i>.04</i>
10-19	34	<b>.24</b>	<i>.25</i>	11	<b>.07</b>	<i>.15</i>	23	<b>.17</b>	<i>.22</i>
20-29	52	<b>.38</b>	<i>.32</i>	13	<b>.09</b>	<i>.15</i>	39	<b>.28</b>	<i>.30</i>
30-39	23	<b>.15</b>	<i>.21</i>	13	<b>.08</b>	<i>.14</i>	10	<b>.07</b>	<i>.14</i>
40-49	32	<b>.21</b>	<i>.17</i>	21	<b>.13</b>	<i>.21</i>	11	<b>.08</b>	<i>.11</i>
<b>Total</b>	<b>143</b>			<b>59</b>			<b>84</b>		

# APPENDIX B3      Studies 3 – 4c

**Table 8      Study 3: descriptive statistics for the distribution of participants' own anticipated regrets, with frequencies, mean proportions and standard deviations (*N* = 50)**

	Combined			Specific			General		
Decade	<i>f</i>	<i>M</i>	<i>SD</i>	<i>f</i>	<i>M</i>	<i>SD</i>	<i>f</i>	<i>M</i>	<i>SD</i>
10-19	0	-	-	-	-	-	-	-	-
20-29	55	<b>.31</b>	.26	22	<b>.12</b>	.17	33	<b>.19</b>	.20
30-39	55	<b>.29</b>	.26	3	<b>.02</b>	.07	52	<b>.27</b>	.26
40-49	39	<b>.225</b>	.26	1	<b>.005</b>	.04	38	<b>.22</b>	.26
50-59	17	<b>.10</b>	.17	2	<b>.01</b>	.05	15	<b>.09</b>	.15
60-69	9	<b>.055</b>	.21	1	<b>.005</b>	.03	8	<b>.05</b>	.21
<b>Total</b>	<b>175</b>			<b>29</b>			<b>146</b>		

**Table 9      Study 4a: descriptive statistics for the distribution of participants' own anticipated regrets, with frequencies, mean proportions and standard deviations (*N* = 65)**

	Combined			Specific			General		
Decade	<i>f</i>	<i>M</i>	<i>SD</i>	<i>f</i>	<i>M</i>	<i>SD</i>	<i>f</i>	<i>M</i>	<i>SD</i>
0-9	4	<b>.01</b>	.09	1	<b>.004</b>	.02	3	<b>.01</b>	.07
10-19	41	<b>.15</b>	.24	12	<b>.04</b>	.12	29	<b>.11</b>	.22
20-29	99	<b>.37</b>	.27	17	<b>.06</b>	.12	82	<b>.31</b>	.25
30-39	58	<b>.22</b>	.18	6	<b>.02</b>	.06	52	<b>.20</b>	.18
40-49	36	<b>.14</b>	.17	0	--	--	36	<b>.14</b>	.18
50-59	14	<b>.05</b>	.11	1	<b>.004</b>	.02	13	<b>.05</b>	.11
60-69	11	<b>.05</b>	.13	0	--	--	11	<b>.05</b>	.13
<b>Total</b>	<b>263</b>			<b>37</b>			<b>226</b>		



**Table 10 Study 4b: descriptive statistics for the distribution of regrets predicted for a peer, with frequencies, mean proportions and standard deviations ( $N = 81$ )**

	Combined			Specific			General		
Decade	<i>f</i>	<b>M</b>	<i>SD</i>	<i>f</i>	<b>M</b>	<i>SD</i>	<i>f</i>	<b>M</b>	<i>SD</i>
0-9	2	<b>.01</b>	<i>.03</i>	0	--	--	2	<b>.01</b>	<i>.03</i>
10-19	50	<b>.14</b>	<i>.19</i>	10	<b>.03</b>	<i>.09</i>	40	<b>.11</b>	<i>.17</i>
20-29	138	<b>.37</b>	<i>.21</i>	20	<b>.05</b>	<i>.13</i>	118	<b>.32</b>	<i>.20</i>
30-39	82	<b>.23</b>	<i>.18</i>	5	<b>.01</b>	<i>.06</i>	77	<b>.22</b>	<i>.17</i>
40-49	39	<b>.11</b>	<i>.14</i>	6	<b>.02</b>	<i>.05</i>	33	<b>.09</b>	<i>.13</i>
50-59	26	<b>.08</b>	<i>.13</i>	1	<b>.003</b>	<i>.02</i>	25	<b>.07</b>	<i>.12</i>
60-69	20	<b>.06</b>	<i>.15</i>	1	<b>.003</b>	<i>.02</i>	19	<b>.06</b>	<i>.15</i>
<b>Total</b>	<b>357</b>			<b>43</b>			<b>314</b>		

**Table 11 Study 4c: descriptive statistics for the distribution of regrets predicted for an average person, with frequencies, mean proportions and standard deviations ( $N = 73$ )**

	Combined			Specific			General		
Decade	<i>f</i>	<b>M</b>	<i>SD</i>	<i>f</i>	<b>M</b>	<i>SD</i>	<i>f</i>	<b>M</b>	<i>SD</i>
0-9	0	--	--	0	--	--	0	--	--
10-19	33	<b>.11</b>	<i>.16</i>	10	<b>.03</b>	<i>.08</i>	23	<b>.08</b>	<i>.13</i>
20-29	140	<b>.46</b>	<i>.25</i>	29	<b>.09</b>	<i>.15</i>	111	<b>.37</b>	<i>.25</i>
30-39	90	<b>.29</b>	<i>.24</i>	11	<b>.03</b>	<i>.08</i>	79	<b>.26</b>	<i>.24</i>
40-49	32	<b>.11</b>	<i>.16</i>	2	<b>.01</b>	<i>.04</i>	30	<b>.10</b>	<i>.15</i>
50-59	9	<b>.03</b>	<i>.11</i>	0	--	--	9	<b>.03</b>	<i>.11</i>
60-69	0	--	--	0	--	--	0	--	--
<b>Total</b>	<b>304</b>			<b>52</b>			<b>252</b>		

## APPENDIX B4      Study 5

**Table 12      Reliability statistics for the filler cluster, with alpha ( $\alpha$ ) and Pearson correlation.**

<i>Cluster and Alpha (<math>\alpha</math>)</i>	<i>Item-total correlation</i>	<i><math>\alpha</math> if item deleted</i>
<b>Fillers (<math>\alpha = .59</math>)</b>		
<i>Bored</i>	.25	.62
<i>Confused</i>	.40	.49
<i>Disillusioned</i>	.46	.43
<i>Resentful</i>	.45	.46

**Table 13      Correlations between the filler cluster and the four target clusters**

	<i>Moral</i>	<i>Hot</i>	<i>Wistful</i>	<i>Despair</i>
<b><i>Filler</i></b>	-.27	.39**	.04	.49**

\*\* Correlation significant at the 0.01 level (2-tailed)

**APPENDIX B5      Study 6**

**Table 14 Time elapsed for specific regrets: single sample t test**

<b>Timelapse</b>	<b>M</b>	<b>SD</b>	<b>M diff</b>	<b>t</b>	<b>df</b>	<b>p</b>
Instant	.65	.48	.45	4.89	26	.00
Days	.18	.37	-.02	-.30	26	.77
Weeks	.04	.19	-.16	- 4.40	26	.00
Months	.12	.32	-.08	- 1.23	26	.23
Years	.01	.06	-.19	- 15.20	26	.00

Test value = .20

## APPENDIX C: FORMULAE

<b>C1</b>	Partial decade adjustment	327
	Studies 1 & 2           (experienced regrets)	
	Study 3               (anticipated regrets)	
<b>C2</b>	Studies 1 – 6           Formulae for calculating effect sizes ( $r$ )	329

## APPENDIX C1      Partial decade adjustment

### Studies 1 & 2: Experienced regrets

Calculation used for the adjustment in Decade 7, based on a formula used by Berntsen & Rubin (2002).

In Study 1 this adjustment was calculated within each group using the group *n*. In Study 2 it was calculated using the sample N

1. Calculate the average age past the decade boundary to give a measure of how much the average person had lived through that decade
2. Add to this 6 months (0.5 yrs) because a person who gives their age at X is on average X.5yrs old.
3. Divide the number of regrets in decade seven by the number of years lived through that decade to give an average number of regrets per year in that decade
4. Multiply the regrets per year by the years remaining in decade 7 to give an estimate of how many regrets would have been produced had all participants completed the questionnaire on the last day of the decade.
5. Divide the product of Step 4 by the number of participants in the group to give a proportion of the extra regrets that would be allocated to each participant.

Study 1 recategorised regrets: example.

#### Specific regrets:

Average age = 65 yrs.

Years lived past the decade boundary (59) =  $6 + 0.5 = 6.5$  yrs

Decade 7 regret total = 9

Regrets per year =  $9/6.5 = 1.4$

Years remaining in decade = 3.5 yrs

Adjustment =  $3.5 \text{ yrs} \times 1.4 = 5$  extra regrets

### Study 3: Anticipated regrets

The formula for calculating the adjustment is essentially the same as that used in Studies 1 and 2 except that it adjusts for the fact that not all participants have the same amount of future ahead of them as defined by the parameters of the study.

Average age = 21.6 yrs

Average age past the decade boundary (19) = 2.6 yrs + 0.5yrs = **3.1yrs of the decade have been used**

Years remaining in the decade = 6.9 yrs.

Regret total in decade 3 = 38

Regrets per year =  $38/6.9$ , = **5.5**

Regrets that could have been generated =  $5.5 \times 3.1$

Adjustment = **17 regrets**

## **APPENDIX C2      Formulae for calculating effect size $r$**

### **Studies 1 - 6**

**For t-tests:** 
$$r = \frac{\sqrt{t^2}}{t^2 + df}$$

**For Wilcoxon tests:** 
$$r = Z/\sqrt{N}$$
  
(N = the number of observations)